
AN ESSAY
ON THE
PRIMITIVE UNIVERSAL STANDARD
OF
Weights and Measures.

BY
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RECORDS
OF
ANCIENT SCIENCE,
EXEMPLIFIED AND AUTHENTICATED
IN THE
PRIMITIVE UNIVERSAL STANDARD
OF
Weights and Measures.

COMMUNICATED IN AN ESSAY TRANSMITTED

TO

CAPT. HENRY KATER,
VICE-PRESIDENT OF THE ROYAL SOCIETY.

BY

CAPTAIN T. B. JERVIS,
OF THE ENGINEER CORPS.

“ I applied mine heart to know, and to search, and to seek out wisdom, and the reason of things, and to know the wickedness of folly, even of foolishness and madness :—

“ Lo, this only have I found, that God hath made man upright, but they have sought out many inventions.”

[*Ecclesiastes, Chap. vii. vers. 25 and 29.*]

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PREFACE.



Ἄρχὴ φιλοσοφίας συναίσθησις τῆς αὐτοῦ ἀσθενείας, καὶ ἀδυναμίας
περὶ τὰ ἀναγκαῖα.—*Epictet. Arrian.*

“The consciousness of one’s own weakness and incapacity in matters of the greatest concern, is the beginning of *True Philosophy*.”

It is not improbable that the following particulars would never have met the public eye, but for the accidental perusal of an article in the 31st No. of the *Westminster Review*, for January, 1832, entitled, *A Review of Introductory Lectures on Political Economy*, being part of a course delivered in Easter term, 1831, by Richard Whately, D. D. Principal of St. Alban’s Hall; Professor of Political Economy in the University of Oxford.

In looking over some numbers of this periodical at the house of a friend, I observed an article on weights and measures, which attracted my attention, the more particularly as I was then engaged in researches on that subject. In a leisure hour I glanced over the first article also, in which the reader may find the following remarkable observations :

“ The fifth lecture contains a disputable theory, but one that only remotely involves any practical inferences. The theory alluded to is, that men never did, nor can raise themselves, from a state of complete barbarism, without instruction and assistance from people already civilized ; from which it is concluded, that civilization must have been the effect of a supernatural revelation made to some portion of the human species, and that all savages must originally have degenerated from a more civilized state of existence. Of this degeneration, the Lecturer thinks there is little reason to doubt, that the principal cause has been war. Objections may be urged to the theory, without questioning any of the authorities to which the author refers. The only notices of arts, furnished by the record of Genesis, (as noted by the author, in page 139,) consist of two, the working of metals, and the construction of musical instruments ; and in neither case is there any intimation of supernatural instruction. Some appearance of an opposite nature might be held to be contained in the mention made of coats of skins ; but the author has not considered this as ground whereon to found an argument. If

knowledge came originally by inspiration, the chosen race contrived to carry away very little of the benefit. The inhabitants of Egypt had far outstript them, when their patriarchs entered that house of bondage; or Moses would never have been celebrated as learned in all the wisdom of the Egyptians. Many ages afterwards, Solomon, or his historians, knew no nearer proportion of the circumference of a circle to the diameter than that of three to one. (1 Kings vii. 23; and 2nd Chron. iv. 2.) There was no necessity for saying what the circumference was at all; and a writer who had known that the circumference of a circle of ten cubits diameter was, on a rough estimate, thirty-one cubits and a half, would never have volunteered asserting it was thirty. It is scarcely credible that a native of New Holland should not know that the girth of a tree is more than three times its thickness. Whatever Solomon might have done for Botany or Zoology, it is clear he had not done much for the geometry of his subjects."

Probably some of my readers will be reminded, after the perusal of the foregoing and subjoined interpretations of the very same

passages of Scripture, of that steady practised attention which is necessary to the performance of minute optical or chemical experiments, and the timely perception of their results; for like those dark lines seen in the solar spectrum by Fraunhofer, the real beauties of Scripture require to be beheld in certain positions;—the observer must be instructed “*how to see them**.” Now the true account of the matter is briefly this :

The sacred Scriptures incidentally describe a brazen vessel, which was of an oblate spheroidal form, the dimensions, (which are stated in measures, which our English version translates cubits) being the 72,000,000ths of the earth’s polar circumference, the capacity divided by 2,000, gives the content of the Jewish *bath*, or *epha* ; six times which quantity gives the cube of the Jewish cubit, or *amma*; and double the cube root of this cubic cubit, the mean length of the second’s pendulum, or pendulum which vibrates 86,400 times in a mean solar day, at the level of the ocean, in

* Babbage on the Decline of Science in England ; contrast of Dr. Wollaston’s and Sir Humphry Davy’s Philosophical Characters.

latitude 45° , at the temperature of $39\frac{1}{2}^{\circ}$ of Fahrenheit's scale, in vacuo.

This pendulum, divided into 48 parts, or 28 parts, furnishes an exact explanation of all linear measures throughout the world in all ages.

This pendulum cubed, and divided exactly as in the preceding case, into 48 or 28 parts, furnishes an exact explanation of all measures of capacity throughout the world in all ages.

This pendulum cubed, and multiplied into the weight of a cubic inch of distilled water, at the maximum of density $39\frac{1}{2}^{\circ}$ of Fahrenheit, each cubic inch weighing 252·984 grains Troy ; divided as above into 48 or 28 parts, furnishes an exact explanation of all the weights of whatever kind, whether money or gross weight, throughout the world in all ages.

Lastly, the 200,000ths of a degree on the meridian, in latitude 45° , or the 72,000,000ths of the earth's polar circumference, furnishes the basis or element of itinerary and superficial measure, throughout the world in all ages; and this element is identically the same as that used in the construction and computation of the molten sea of Scripture, from which the linear standard, or mean length

of the pendulum is deduced; being in the ratio of 5 to 9, with respect to the forty millionth of the earth's meridional circumference, in the ratio of 5 to $2\sqrt{20}$, with respect to the mean length of the second's pendulum, both at the temperature of $39\frac{1}{2}^{\circ}$ of Fahrenheit's scale.

The following account of this curious question may probably enable those who have not yet seen it in the same light, to discover the same or greater evidences of wisdom, design, and truth. The argument, as it affects the excellency and integrity of the original text of Scripture, is one thing; its application to the discovery, understanding, and correction of abuses in the Metrological and Monetary systems of all nations, is scarcely less momentous than the former. The philanthropic Budæus is thought to have dreamed over an Eutopian prospect, when he described the blessings that would attend an uniform and universal currency, and weight and measure,

“Una fides, pondus, mensura, moneta sit idem,
Et status illæsus totius orbis erit.”

But what if the system here described is founded in fact? what if mathematically and practically true? the conclusion will be, not

that nothing has a greater tendency to grow worse, or more obstinately resists improvement:---but that no matter of so great and universal interest has a greater tendency to retain its original character and construction ; nothing, in short, so obstinately resists innovation, and the substitution of human devices for Divine laws, as weights and measures.

What, for example, will be said of a system that provides a perfect corrective for the Metrology of England, France, and India ? In regard to England and France, it will be clearly seen, that the discarded measures, (say for instance, as notorious proofs, *the measures of capacity*,) are founded on the strictest and most scientific principles, and that there was therefore no necessity to alter those in use, which, to quote the reasons of the British commissioners to the legislature, have the prescriptive sanction of long usage, and require adjustment and conformity to some known standard, rather than any positive alterations. In these cases, it was sufficient to have established the true length of the pendulum, taken at a mean throughout the globe, and the law of its expansion and contraction, and the specific gravity of water at its maximum of density,

to *regulate* all the monetary and metrological rules of both countries :—it was sufficient to have determined the forty millionth of the earth's polar circumference, to have corrected and defined the itinerary and superficial measures of both. What would have ensued on referring the ancient schemes to such physical investigations? Not the discontent, and murmurings, and objections of the French people, not the suggestions of every self-inaugurated political economist, but uniformity, exactness, comprehensibility; an amelioration of great and certain evils, by simple, unquestionable, and incalculable benefits. The result would have been, that all foreign nations, all their colonies at least, would have adopted the same principles, and every man would know when he bought or sold, how much he gave and how much he got for a certain sum.

The peculiar gain and honour that would redound to our Indian Governments, by the first introduction of this exact standard, is clear and certain : all the methods of meting and selling might remain in *statû quo*—the *hat'h* and the *guz*; the *pharra* and the *kun-dee*; the *garce* and the *murcal*; the *mun* and the *seer*; the *beegah* and the *kos*, might retain

all their old names, provided they were regulated and defined by the mean length of the pendulum ; the weight of water at a maximum of density ; and the metre or forty millionth of the earth's polar circumference. A British, a French, an American, or in fact, any merchant, might then transact all his business on sure and intelligible data, known and observed by all these nations ; and the Indian Government would be protected against innumerable frauds in the intermediate transactions of the revenue :—the poor unlettered *ryot*, or cultivator, the needy and despised heathen, discover, that in depriving the designing of the power and himself of an example to corrupt dealing, the Divine Being had indeed sent a Christian people to direct, to preserve, and to bless them.

There is yet a third question on which the subject bears ; general literature, and history : the first without a professed and useful object, is a gewgaw for grown-up children ; but history, the history of man ; of the progress of intellect, of society, of the powers and propensities of immortal beings, is of infinite concern. We must dethrone every high thought however before we can arrive at knowledge ;

and the knowledge of ourselves will be seen best in the mirror of past ages, in the course of human events, to which the seal of confirmation is irrevocably set, without room for further cavil, or possible mistake. In that history we have sufficient examples to instruct us in every thing that can conduce to our comfort here, and our happiness hereafter. To conclude ; whether this Essay be taken up by the Christian, the statesman, or the historian, it is to be hoped, that it will obtain a patient and impartial consideration ; that what is advanced may be received, so far only as it consists with truth ; that it may be reprobated and forgotten where it militates either against fact, experience, or utility.

T. B. JERVIS.



ESSAY

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Nunquam ita quisquam bene subductâ ratione ad vitam fuit,
Quin res, ætas, usus semper aliquid apportet novi,
Aliquid moneat ; ut illa quæ te scire credas, nescias,
Et quæ tibi putâris prima, in experiundo ut repudies.

TERENT. ADELPHI, Act. 5, Sc. 1-2, ad initium.



THE difficulty of dislodging prejudices, engendered by false or imperfect principles, has always been found the greatest obstacle to the communication of truth. Conclusions addressed to the mind or senses, although worthy of universal reception, are too frequently seized upon by the fancy, sometimes wrested, but much oftener abused, to the increase of pride, or the detriment of knowledge. And so it fares with that which is pre-eminently excellent, till perchance experience, or time, or conviction, disciplines the understanding to the perception of error,

and discovers the futility of reliance on its own unassisted resources.

Historians and philosophers in general allege that science and art are the creation of the human intellect ; that they came by inspiration appears indeed the more problematical, because the evidences to this effect are infinitely less obvious than the arguments for the contrary opinion are plausible. Whether this or that be a prejudice remains to be proved : it is plain, however, that no prejudice can consist with truth ; wherefore one or other must be repugnant to sound reason : if then it can be demonstrated, that science subsisted when as yet that very history and philosophy which affirms it to be of human original was not created, we are free to believe that it came by inspiration, or, which amounts to the same thing, that the elements of science, the legitimate uses to which they were applicable, and the faculty to appreciate, improve, and extend them, were imparted to our forefathers by the Supreme Being. Among other interesting and notable proofs of the truth of this position, the following may be selected ; they appeal in fact to the utmost range of historical evidence, they bespeak likewise the highest refinements of mathematical skill, and for these reasons, are peculiarly suited to illustrate the latter hypothesis : 1st. That the metrological systems of all nations, throughout the earth, had a common original. 2ndly. That the true standard or prototype is discoverable from certain passages of Holy Writ. 3rdly. That this

primitive universal standard is the mean length of the second's pendulum throughout the earth.

It may be proper to state, that I had made this subject my particular study, independent of the question at issue, and came to it therefore prepared with a great variety of examples and arguments : with these I have illustrated each statement, sparingly, though perhaps sufficiently for its confirmation. To go through the laborious details by which I was led to the knowledge of these matters, would be uninteresting and superfluous. From a diligent examination of the opinions of Drs. Bernard, Cumberland, Greaves, of Danville, Sir George Shuckburgh, Bailly, as well as the more recent compilations of modern authorities, brought under one view in Tillet's Tables, and Dr. Kelly's valuable *Universal Cambist*, I felt a conviction that no one had ever yet formed a correct estimate of the true length of the first fundamental measure, so appropriately designated by the Hebrews and Patriarchs of old, *Amma*, or the mother of measures of every denomination, which term, in all the translations of scripture, is rendered by the word cubit, or its synonyms.

Having been furnished by the public authorities, under the Bombay Presidency, with every sort of official and well-authenticated information, that could be procured from the Government records ; and through the friendship of the late James Joseph Sparrow, Member of the Council, with a very full opportunity of ascertaining the exact dimensions of

those in use throughout the Konkun*, the deductions were all to this effect, that the true cubit was a measure of about nineteen and a half inches English ; that land measure was also grounded on this same linear standard ; moreover, that all measures of capacity were derived from the cube of this cubit, its multiples and aliquot parts ; lastly, that weights, and in connection with them, the weights of all ancient and modern coins, were likewise referrible to the weight of the like quantity of rain or distilled water—its multiples and aliquot parts ; but whence, or at what period, this system was introduced, neither ancient tradition, or literature, whether Hindoo or Mahomedan, nor even the most learned Brahmins or Mahomedans themselves, could afford me the slightest intelligence.

Engaged by the remarkable simplicity and characteristic skill, thus discernible in the first elements of the metrological system of Western India, I followed up the pursuit in respect to those of other parts of the world. By the singular liberality of the Right Honorable Sir Frederick Adam, who is now at the head of the Madras Government, and of the Right Honorable Sir Robert Wilmot Horton, the Governor of Ceylon, I was furnished with copies of every document that could be obtained from the public records and other sources, relative to the weights and mea-

* A province on the north-west coast of peninsular India, subordinate to the Bombay Government.

asures of Southern India, throughout the dependencies of the Honorable East India Company and the Crown. With regard to Northern India, and the Presidency of Bengal, I obtained every thing desirable from parliamentary and other public documents, from the revenue and judicial selections, printed by authority of the Court of Directors of the East India Company, besides sundry manuscript and published particulars: the conclusions, therefore, as respects India generally, are drawn up from the very best possible sources of information, and so far as reliance can be placed on written testimony, are deserving of the public attention.

The sum of these investigations, as respects every local and general usage throughout India, or elsewhere, is very much of the same nature, and is best to be learnt from the standard itself. I shall therefore confine myself to an account of the second and third parts of the subject, then shew how these bear on the first, and finally the great beneficial uses to which the results may be made subservient.

In the curious buildings of the Temple of Solomon, there is the strongest presumptive evidence for the belief, that two distinct linear measures were had recourse to, the one being the very pendulum of which we are in search. (See 2 Chron. chap. iii. ver. 3.) This opinion being founded on the significant import of the Hebrew text, *Ha orek ammoth bammiddah ha reeshonah*: the last word is rendered in the Septuagint, $\eta \pi \rho \omega \tau \eta$, the English translation thus ex-

presses it: "the length by cubits after the first measure;" the very existence however, of this measure might, but for what is given in the sequel, be considered purely speculative and problematical. The other is conformable to the reputed Egyptian or royal Babylonian cubit, which has been ascertained by reference to many remarkable criteria, as the annual rise of the Nile, the base of the great Pyramid, &c., to be equivalent to 21·874675 inches English nearly.

Among the vessels of the same temple, the most remarkable was the one denominated the molten sea, the description and dimensions of which have furnished sceptics with matter for some very smart reflections, as no very apt illustration of the far-famed wisdom of Solomon; and covertly throwing out a pitiful insinuation as to the inspiration or authenticity of the sacred volume itself. The two passages, descriptive of this molten sea, seemingly involve a contradiction, which has been too long allowed to pass uninvestigated in those venerable seminaries of learning, where mathematical knowledge of the highest order goes hand in hand with a study of the Hebrew, the classic, and oriental languages; yet it is not presumptuously imagined, that the explanation hereunder offered, may not be far better given by those who have grown grey in such studies, and have access to materials, and books, and talented mathematicians—advantages, in fine, that could never be expected in so very remote a place as this, and at the hands of one, who, to the profession of a Military

Engineer, labours under the same disqualifications of an imperfect education, in those departments of science, essential to its explanation.

The two passages are as follows : “ And he made a molten sea, ten cubits from the one brim to the other : (Hebrew, “ from his brim to his brim ;”) it was round all about, and his height was five cubits, and a line of thirty cubits did compass it round about.”—“ And it was an hand breadth thick, and the brim thereof was wrought like the brim of a cup, with flowers of lilies : it contained two thousand baths.”—1 Kings, chap. vii. ver. 23 and 26.

The second passage runs thus : “ Also he made a molten sea, of ten cubits from brim to brim : (Hebrew, “ from his brim to his brim ;”) round in compass, and five cubits the height thereof ; and a line of thirty cubits did compass it round about.”—“ And the thickness of it was an hand breadth, and the brim of it like the work of the brim of a cup, with flowers of lilies ; and it received and held three thousand baths.”—2 Chron. chap. iv. ver. 2 and 5.

The well-known ratio of the diameter to the circumference of a circle is certainly calculated to impeach the above statement on a careless and hasty perusal, but to affect the mind far otherwise, if apprehended rightly as a mathematical representation of a vessel, the content whereof may be readily ascertained from the three dimensions therein given. It now remains for the sceptic to disprove, by the

doctrine of probabilities, that the elements of a system perfect in the highest degree, and applicable in all cases, and under all circumstances and conditions of society, whether simple or refined, whether limited or extensive, should be incidentally elicited from sundry scattered passages in any book of ancient laws, and yet have had no real existence before those laws were promulgated : when moreover traces of this system are clearly discernible throughout all ages, among the systems of all other nations whatever, of which no possible account could be given, without reverting to that code, its history, scope, and design. I neither beg the question, that this is an inspired book from beginning to end ; nor do I, although on both these points my own mind is fully made up, insist that the Hebrew text, as we now possess it, has not undergone any material alterations ; but affirm, on the plainest rules of argumentative analysis, and sound reasoning, that the internal evidences of its accuracy are irresistibly conclusive.

The vessel in question, therefore, was of an oblate spheroidal form ; that is, the half of a solid, generated by the revolution of an ellipse on its conjugate axis, the conjugate remaining fixed, because the depth is stated to be half the length of the transverse : the mutual relation of the periphery, transverse diameter, and depth, to the content and conjugate, implying as perfect a knowledge of the ratio of the diameter to the circumference, as we now possess. For, let t denote

the transverse diameter = 10 cubits ; p , the periphery = 30 cubits ; $c^* = 3\cdot14159265358979+$; and x , the conjugate, or fixed axis, then $x = t - \frac{4}{c} \frac{p}{c} + 4 \sqrt{\left(\frac{2}{c} \frac{p}{c} - t \right) \times \frac{p}{c}} \Bigg) ; = 9\cdot087698466896 +$ cubits : again, denoting this by f , the revolving axis of ten cubits by r , the capacity of the molten sea will be = $\cdot261799387799149 \cdot f r^2 \times 21\cdot874675^3 = 2492075\cdot37296$ cubic inches English measure, the two thousandth part whereof gives 1245\cdot1377 cubic inches English for the content of a single bath.

Now, although at first sight, the two passages appear to involve a contradiction in terms, the English rendering implies, somewhat indistinctly, that nice critical discrimination which is observable in the context : in the one instance, it is said “ it contained two thousand baths, *Shoshan alfayim bath yabil* ; where we find,” “ it contained,” *yabil* ; in the other, “ it received and held three thousand baths,” *Makhzik bathm shlosheth alfin yabil* ; where another expression, *makhzik*, “ it received,” is superadded to *yabil*, “ it held.” The first of these, namely, *makhzik*, (like all primitive words,) is derived from a root of a very determinate signification, *khazak*, “ to hold,” “ to contain,” “ to oblige,” “ to stay,” “ to overpower,” “ to prevail over :” (see the

* The difference between the approximate and exact ratio of diameter to the circumference, though exceedingly inconsiderable in ordinary computations, would, if neglected in the present instance, affect the length of the pendulum so much, as to invalidate the argument, and is therefore an additional proof of its conclusiveness.

original passages, 1 Sam. chap. xvii. ver. 50; 2 Sam. chap. xxiv. ver. 4; 1 Chron. chap. xxi. ver. 4; and many others,) intimating something heaped up, and that the quantity so heaped was the utmost that could be retained. The first instanced therefore was a liquid measure of two thousand baths; the second, a dry measure of three thousand baths: the contents of both, as enjoined in other parts of Scripture, notwithstanding the dry and liquid measure, were discriminated by distinct names, being founded on, or referred to a common principle. “The *ephah* and the bath shall be of one measure, that the bath may contain the tenth part of an *homer*, and the *ephah* the tenth part of an *homer*, the measure thereof shall be after the *homer*.” Ezekiel, chap. xlv. ver. 11; lastly, Dr. Cumberland has shewn in the 16th vol. of the Philosophical Transactions of the Royal Society for 1685-6, that the Jewish *ephah* or bath was the sixth part of the cubic cubit, (in his Essay he calls it one-sixth of the Jewish cubic cubit :) now, six times the above quantity, or $1245 \cdot 137686^* \times 6$ is $7470 \cdot 8261188813$ cubic inches English measure, or the cube of the cubit, the cube root whereof is $19 \cdot 548925$ inches English.

But by Captain Kater's recent experiments, the length of the pendulum, which vibrates seconds, or 86400 times in a mean solar day, at London, in latitude $51^\circ 31' 8 \cdot 4''$ in vacuo, reduced to the level of the sea, was found to be $39 \cdot 13929$ inches of Sir George

* The content of the *ephah*, or bath, determined from the molten sea of Solomon's temple.

Shuckburgh's scale, at the temperature of 62° Fahrenheit : comparing this with the principal observations elsewhere, the mean length in latitude 45° may be considered = 39.1163 inches : recourse being had to Captain Sabine's table, published in the 2nd volume of the Philosophical Magazine, (No. 9, September, 1827, page 177 ;) Biot's Observations Geodesiques, pages 441, et sequent.; and Professor Carlini's Experiments on Mount Cenis, Ephemeride di Milano (for 1824 ;) Quarterly Journal of Science and Arts, (volume 2nd new series.) The double of the above cubit is equal to 39.09785 inches, being only 184 ten thousandths of an inch in defect of the mean length of the second's pendulum, in latitude 45° , from actual experiment ; a defect which may depend on the force of gravity, or some such delicate minutiae, attendant upon atmospheric pressure, temperature, and the laws of attraction.

The relative proportion of the heaped or dry measure, over and above the liquid contents of the molten sea, was therefore as one to two ; precisely in conformity to that property of the cone and sphere, first demonstrated by Archimedes ; the true analogy of the diameter and circumference, the nature and properties of the ellipse, are likewise indispensably mixed up with these preliminary computations. Now

$\frac{f r^3 \times p}{12}$, expresses the capacity of the oblate spheroidal vessel, or 237.913368 cubic cubits, as does $\cdot 7854 \times f r$, the area of the elliptic base of the conoid ;

and because the solidity of the heaped measure exceeded the liquid contents by one-half this last quantity, three times $\frac{f r^2 p}{12} \times \frac{1}{2} \times \frac{4}{f r p}$ or cancelling the common terms, $\frac{r}{6} \times 3 = \frac{30}{6} =$ five cubits, expresses the height of the cone, which thus turns out to be a right angled elliptic cone, (if I may venture this definition of a solid forming part of a right cone,) and this height corresponds to the maximum of altitude, to which wheat, the grain specified in the same chapter of Ezekiel, could be heaped up in a vessel of the dimensions instanced.

Before we quit this part of the subject, let it be observed, that with the nice refinements of modern science, a cubic inch of distilled, or rain water, in the atmosphere, at 62° of Fahrenheit, when weights of brass are used, has been found to weigh 252.458 grains troy; in vacuo, 252.72 grains; as declared in the third and last report of the British Commissioners to His Majesty, dated 31st March, 1821. Now the expansive force of water, according to Dr. Young's catalogue raisonnée, Natural Philosophy, vol. ii, page 391, from a collation of experiments by Gilpin, Kirwan, and Achard, reckoning the 39th degree of Fahrenheit the maximum temperature of greatest density, is expressed by $22f^2 (1 - .002f)$ in ten millionths, (where f denotes the difference of temperature:) in the present case, I reckon the ratio of the expansive force from $39\frac{1}{2}$ degrees Fahrenheit to 62° ,

(in vacuo,) as one to 0·998956; the cubic inch of water therefore is equal to $\frac{252\cdot72 \times 10\cdot00000}{0\cdot998956} = 252\cdot984$ grains troy. Dr. Young estimates it a little less, or 252·980 grains troy. Therefore, the weight of a cubic inch being reckoned 252·984 grains troy, multiplied into 1245·1377 cubic inches, is equal to 315000 troy grains, which corresponds to 720 Roman ounces of the ancient account, each of 437·5 grains troy; 60 Roman pounds of 12 ounces, each of 5250 grains troy; or lastly, 45 lbs. ancient English avoirdupoise account, each of 7000·0 troy grains, the pound of sixteen ounces, each ounce, as before, of 437·5 troy grains. Since the cubit is the half of the second's pendulum, one-sixth of the cube of half the pendulum, is $\frac{1}{8}$ th the cube of the whole pendulum; there were therefore 2160 lbs. avoirdupoise English in that cubic content, or 2880 Roman lbs. of 12 ounces each.

Further, as the ancient land measure of India was a rod of ten cubits, so we find the tenth part of the English land measure = 19·8 inches, and this erroneous standard may have arisen out of the arbitrary principle of reckoning the ton equal to eighty quarters each of twenty-eight pounds avoirdupoise, of 7000 grains troy, or the converse; for $28 \text{ lbs.} \times 7000 \text{ grains troy,} \times 80 = 15680000 \text{ grains, and } \sqrt[3]{\frac{15680000}{252\cdot458}}$

divided by 2, gives the correspondent measure = 19·801 inches English. Whereas a well authenti-

cated memorial of the true original standard is still preserved in the standard wine gallon of Henry the VIIth, which may be thus immediately derived from the primitive universal standard : 39·09785 inches cubed, is equal to 59766·6107, the fourth part of which is the true ancient quarter = 14941·6526 cubic inches : the eighth part thereof, is the true ancient bushel of England, = 1867·7065 cubic inches, and finally, the eighth part of this last measure, the true original content of the ancient wine gallon, = 233·46337 cubic inches ; a standard record whereof, was preserved in our national repositories to the days of Henry the VIIth. How nearly this has been found to agree with the measure of a gallon, thus deduced from the primitive standard, may be learnt on reference to the Parliamentary reports, the statute books, and the researches of the Royal Society's Commissioners. The evidence of Mr. Leader, the city gauger, and Mr. Flamstead, in the cause brought into the Court of Exchequer in 1700, (Quarterly Review, volume 36, page 142,) is a strong corroborative proof of the above conclusion ; " they, and several other artists skilled in gauging," being all agreed, that " a wine gallon ought to contain 231 cubical inches, and no more ; that there was such a gallon kept from time out of mind at Guildhall, as a standard of that measure." Computing the cubit from the above, $\frac{1}{2} \sqrt[3]{231 \times 8 \times 8 \times 4}$, = 19·47992 inches English, or about 69 thousandths of an inch less than the primitive cubit. On this same principle we dis-

cover the original of the French septier of the old system, which is one-seventh the cubic pendulum, or 8538·0872 cubic inches ; the boisseau, 1067·2609 cubic inches English ; the litron, corresponding to the English quart, = 66·7038 cubic inches English. The divisions of this latter national system perfectly explain the origin of the Winchester bushel of Henry the VIIth., and the bushel at Aberdeen of Queen Anne ; for these measures of capacity are one-fourth of the French septier, answering to the minot, old French system, being equal to $\frac{1}{4}$ of $\frac{1}{7}$ (39·09785)¹.
 or $\frac{59766\cdot6107}{28} = 2134\cdot5218$ cubic inches English : the gallon, or eighth part of which measure, is equal to 266·8152 cubic inches English. On what grounds the Select Committee of the House of Commons determined the exact quantity of the gallon from the bushel measure at the Exchequer, which is specified in the report that followed upon the commissioner's labours, does not appear, but it is said to have been found = 266·1 cubic inches English, and doubtless, after the most careful investigation : from this measure, therefore, the primitive universal cubit would appear to be = $\frac{1}{2} \sqrt[3]{266\cdot1 \times 8 \times 4 \times 7} = 19\cdot5314$ inches English.

A like remarkable illustration of the relation of the weights and measures of remote nations to the primitive system may be instanced from the subsisting measures of capacity of the south of India, which, at no very remote period, were common likewise to the whole of the provinces, north of the

Nerbuddha river. Among a large collection of official documents, which were most liberally transcribed from the public records at Madras, and communicated to me by order of the Right Honorable Sir F. Adam, were three elaborate reports on Weights and Measures ; one by Mr. Ellis of the Madras Civil Service, written in 1802, the others drawn up by Major de Havilland of the Engineers, in 1819. These bear ample testimony to the industry of their respective authors, as well as to the benevolent intentions of the Government, to correct abuses, and secure to the people the most equitable and efficient laws, which the combined experience, energy, and talents of its ablest servants could devise. That the suggestions they contained completely failed in the accomplishment of these desirable objects, may well be imagined, from the continuation of the same abuses and misunderstanding to the present day, which then, and now, as heretofore. had called for the interference of the civil authorities.

Mr. Ellis' conversance with the Sanskrit, Tamil, and cognate vernacular languages, would deservedly have entitled his opinions to consideration on any subject connected with the literature and customs of India. Endowed with a sound judgment, he possessed moreover some qualifications, which more particularly recommended his propositions to the favorable notice of the Revenue Board and Government, though ostensibly, they are said to have given them the preference, because they were founded upon the Native system, with which the people were necessarily more familiar than with any which ori-

ginated with foreigners. Major de Havilland's observations were chiefly confined to a specification of the contents of the different standards issued, from time to time, under the authority of Government. His animadversions on Mr. Ellis' plans were probably written without much knowledge of the provincial customs, and certainly with less advertence to the past and present condition of India, or the steps essential to the simplification of this intricate inquiry.

Mr. Ellis, at first, assigned 294,400 cubic inches to the gerise or garce, from trials with a small grain called Oolundoo: he assumes it definitively, to be 300,000 cubic inches; and the murcal, or 400th part of a gerise = 750 cubic inches. Major de Havilland, from numerous experiments, which in principle and fact were altogether illusory, maintained, that the murcal in use was = 828.34 cubic inches, from the mean of five official measures, authorized by the British Government; or, it might be, 834 cubic inches, from the mean of three others, the extremes differing no less than $1\frac{3}{4}$ lbs. avoirdupoise rain water; finally, he proposed a measure of his own contrivance, containing 860.168 cubic inches, because, forsooth, $2\frac{1}{2}$ murcals of this capacity would then exactly correspond with the Winchester bushel, or $\frac{2150.42}{2.5}$ cubic inches; whereas, such suggestion actually disturbed the true measures, both of the Winchester bushel and Indian murcal: for the last was even then held to be of the exact, or very nearly of the same dimensions assigned or assumed by Mr. Ellis: that is $\frac{8 \times 238.46337}{1}$ or $\frac{1867.7065}{2.5} = 747.08$

These are Major de Havilland's words : " 6th. In other publications, in which the Madras weights and measures are given, it is stated, that the garce of 400 murcals, weighing $9256\frac{1}{2}$ lbs., should contain 300,000 cubical inches, and consequently, the murcal, 750." " 25th. All that I can discover of the parrali, is, that it should hold five murcals : in the Madras Almanac, it is stated that it should be a box two feet square, and $6\frac{1}{2}$ inches deep, but this evidently is erroneous, that measurement only gives 3744 cubic inches ; whereas, five murcals, as I have determined them above, by actual measurement, (at 828·34 cubic inches), give 4141·70, which I shall assume*."

The weight above specified is probably assigned on the

* The unsatisfactory, and for the most part imperfect, replies subsequently returned in 1821-2, by the Revenue officers throughout India, to the Honorable Court of Directors' circular, transmitted by the late Lord Castlereagh at the instance of Dr. Kelly, were still less calculated to remove the difficulties in the way of improvement, or to inform the public as to the actual value of the several local weights and measures in each province. In an inquiry of such immediate and acknowledged importance to all classes, much valuable information might reasonably have been expected from persons so peculiarly qualified to obtain it, and undoubtedly most interested in a thorough acquaintance with its minutest details. Whether from indifference, or yet more culpable negligence, the majority would seem to have considered all attempts at reform equally vain and impolitic : some anticipated incalculable evils, from a reference to standards which the community could neither appreciate nor comprehend ; while a few advised the entire supersession of the weights and measures in use, by those of the mother-country, as the best and only effectual provision against fraud and confusion. Amid this contrariety of opinions, the Government was unable to choose, and matters were left in statu quo.

authority of some ignorant person, because 300·000 cubical inches of rain water weigh 10810·6 lbs. (if it be not the weight of rice or wheat occupying that space ;) and this we are treating of is a measure of capacity, not of weight: it is much more consistent therefore to conclude for the cubical content, rather than the weight. Now the parrah measure being the half of the ghunuhustu, or cubic cubit, $\frac{1}{2} \times \sqrt[3]{3744 \times 2 \times 8}$ represents the length of the true primitive cubit, which is 19·5639 inches English: moreover, this parrah measure was truly represented by 16 wine gallons of the standard of Henry the VII. which division of the capacity obtains over all the western coast, subject to the Mharatta rule: the sixteenth part of such parrah or mun measure being termed a pylee, corresponding to the English wine gallon; the fourth part being termed a seer, corresponding to the English wine quart: the half of this last being termed a tipree, answering to the English wine pint measure. There is therefore every reason to believe, since the measures of capacity of western and eastern India agree, not in principle only, but in their cubic contents, that Mr. Ellis's conclusions were legitimate and probable. The gerise or garce however, derived from the primitive universal pendulum, will be 298833·0535 cubic inches, the parrah 3735·4131 cubic inches: the murcal, 747·08263 cubic inches: all these, as every other dry measure, being struck. The same observations strictly apply to the parrah and murcal of Ceylon, which are in all respects

identically the same as those of the Madras presidency, both in regard to dimensions and use.

To return however to the primitive system itself, it may be very readily imagined that the Britons and ancient Saxons derived their knowledge from the Romans. I have instanced and thoroughly examined all the proofs to this effect, which I could meet with, in a separate publication ; but that the Roman measures of capacity were received from the Temple of Jerusalem, may require explanation. Such connection between the usages of Rome and Judea undoubtedly did subsist, in respect of their general polity, which has led superficial inquirers to think more highly of the former, than they deserved, and to undervalue the latter, because the people to whom they were transmitted by their forefathers, knew not how to appreciate them. We have seen that the bath being a measure equal to one-sixth of the cubic cubit, held exactly sixty Roman pounds of distilled water, reckoning 252·984 grains troy to the cubic inch : the hin of scripture therefore, which was one-sixth of the bath, was 120 ounces of 437·5 troy grains each, or 10 lbs. Roman measure, and this was also the exact measure, well known to antiquaries as the congius of Vespasian. It is not improbable that this vessel may still be preserved among other curiosities in the Vatican. The cubic content of the congius, which bore a superscription intimating that it held ten Roman pounds of water, was very accurately ascertained by the learned Dr. Greaves, Astronomi-

cal Professor of Oxford in 1639, to be equal to 229·556 Roman cubic unciae, or 207·597 English cubic inches : the Roman foot taken from the monument of Cossutius, some ancient brass foot rules, and the pavement of the Pantheon, being estimated to contain 967 parts, of which the English contained 1000, and therefore 12·409 Roman solid unciae, corresponded to 12 English cubic inches. He likewise instituted experiments with millet grain, in English wine and corn measures, of quarts, pints, and fractional parts of a pint ; and although he does not specify the cubical contents of the wine and corn measures, we may consider the former at the period of his experiment, (1639,) to have been 231, the latter 268½ cubic inches, commonly called Winchester measure, from Henry the VII.'s bushel, as these were subsequently confirmed by law, in 1688. The congius contained three quarts, one and one-eighth pints of our wine measure ; and three quarts, and about a sixth of a pint of our corn measure ; whence by the wine measure it contained 205·734 cubic inches, by the corn measure 206·737 cubic inches, English measure : the Roman amphora of eight such measures was equal to 1836·448 Roman cubic unciae, or 1660·778 English cubic inches, differing very little from the experiments of Villalpandus, which give 1656·432 English cubic inches for the content of the Roman amphora. This serves equally to show the skill of the operation itself, the correctness of Dr. Greaves' estimate of the length of the Roman foot,

and the connection of the measure of capacity with the primitive system. By Dr. Greaves' estimate, it appears the Roman foot consisted of 967 parts, of which the English contained one thousand, hence the foot measure comes out 11·604 inches English ; one and a half foot, or the Roman cubit, (so called) 17·4 inches : Dr. Bernard reckoned the Roman foot to be 970 thousandths of the English foot ; hence the Roman cubit, (so called) would be 17·46 inches ; now the cube of the first measure, is 5268·02 cubic inches ; the cube of the latter 5322·71 cubic inches ; the congius therefore did not refer to the cubit, (so called,) either of 17·4 or 17·46 inches, nor to the cube of the Roman foot on one, or other authority, the cube of 11·6 being 1560·9 cubic inches ; the cube of 11·64 = 1577·1 cubic inches : it was therefore a foreign measure, or a dry measure raised on a very different principle to the Roman foot or cubit : moreover, since it falls in its proper place in the great patriarchal system, it could only have been received from the Jews, and have represented the *hin*, the sixth part of the *bath*, that is, $\frac{1245\cdot0376864}{6} =$ 207·5065 cubic inches. Josephus clears up the difficulty. " After those triumphs were over, Vespasian resolved to build a temple to Peace," " he laid up therein those golden vessels and instruments that were taken out of the Jewish temple as ensigns of his glory ; but still he gave order that they should lay up their law and the purple veils of the holy

place in the royal palace itself; and keep them there." Josephus' History of the Jewish War ; Book 7th, chap. 5th, § 7. The celebrated Roman congius of Vespasian, (Archæologia, 1781, vol. 25th, Essay by Henry Norris, Esq.) connects the systems of India, and England, and France, with those of Rome and Judea ; and if it were desirable to extend the same scrutiny to other countries, we might, with equal exactitude and ease, establish the conformity of one and all, to their first universal prototype.

To sum up the foregoing particulars ; the primitive standard of weight and measure was the mean length of the second's pendulum throughout the globe at the temperature of $39\cdot5^{\circ}$ of Fahrenheit's scale, at the level of the ocean, in latitude forty-five degrees, at the zero, or maximum of greatest density of water, which determined the standard of weight : this was styled the measure of the sanctuary, being double the length of the ordinary cubit, and is entitled in Scripture, *Ammah ha Recshonah* ; the former equal to $39\cdot09785$ inches English, the latter to $19\cdot54892$ inches English. This measure of the sanctuary was divided in two ways, that is, either into 28 or 48 parts : the cubit therefore consisted of 14 or 24 parts. To the former division of the scale, custom has assigned the name of *tussoos* in India, perhaps we may add also *pollices* in the Latin language, and *nails* in the old English system : to the latter division of the scale, mankind appear to have every where agreed upon the same designation of

digits, or fingers ; four of which are reckoned to the palm, and twelve to the longer span, and 16 to the foot. Also, 45 to the gyrd or yard, or vara of the Saxons ; 42 to the guz of the Saracens, Tatars, and Arabians ; 27 to the clothiers' ell, aune, or braccio ; and 21 to the half guz or lesser ell. Of the former scale, 58 parts constitute the measures of the first Mohammedan empires and conquests ; 24 the guz or artificers' measures of Asia, and the earliest Mohammedan kingdoms ; 20, the clothiers' ells of India, Russia, Germany, introduced or derived from the Tatars and Huns. These embrace the principal modern and ancient nations throughout the earth, but it is to be observed, that Egypt, Chaldea, and Rome blended the foregoing system with another part of the patriarchal economy in a singularly confused manner : of this we shall take more particular account in the sequel, merely observing at present, that the measure alluded to, of 21·8745 inches English, in the construction of the molten sea, was the three-thousandth part of the primitive itinerary measure, and in the ratio of 5 to 9, with respect to the forty-millionth part of the earth's meridional circumference of 5 to 2 $\sqrt{20}$, with respect to the mean length of the second's pendulum in latitude 45° , at the temperature of $39\frac{1}{2}^{\circ}$ of Fahrenheit's scale, which was, as we have already stated, the maximum point of the condensation of water. The relation which those linear and itinerary measures bear to the primitive system will be gradually developed in the account of the division

and application of the system itself. It is to be especially noted that the words cubit, foot, span, digit, pace, and so forth, are purely conventional, wherefore in speaking of the Roman of 17·4 inches, it is added for the sake of perspicuity and consistency, the cubit (so called).

The two scales with their subdivisions and respective dimensions, systematically arranged, exhibit the places which the existing lineal measures of different nations occupy, in the primitive system. In a great many places they conform very exactly to their true prototype; in some they differ, as they do also among themselves, in the component parts of each particular national scheme. Of this discrepancy in the first elements we have already given a clear and remarkable instance in the case of the cubit of England, derived from the rod for measuring land; the itinerary measure and weight, in these =19·8 inches and the more correct account still preserved in the standards of capacity, =19·5314 inches English.

Similar anomalies are readily shown to have prevailed in the old French system; the itinerary and linear measures of which, give 19·3 inches, the septier, minot, &c. the more correct measure of the primitive cubit or half pendulum. Attending with care to the above minutiae, we can hardly be at a loss to discover the analogy of any lineal measure, submitted for examination, to the true prototype.

Thus, imagine a commissioner sent from England to investigate some intricate questions of landed property, in the interior of Bengal ; or which is an infinitely more probable case, suppose a Governor General in Council called upon to pass his sentence on certain plans in contemplation for the adjustment or equalization of the standard rods for the measurement of land, and the apportioning of assessments ; suppose in this case, the utmost prudence and wisdom required, not to innovate, yet not to shrink from the performance of a duty, imperative alike as it affected their own consciences, and the interest of the people : suppose in this case, a statement laid before them of three guz measures, sixty of which squared, had been declared in the time of the wise and great Akbar, the legal beegah : with what facility might persons so situated determine without fear of transgressing either observance, according to the following rule ?

First, the average dimensions of the slabs of marble in the pavement of the Taj Muhal at Agra, produced by one party, the sides of which represented a guz of Shah Jehan, said to be 42 fingers, = 33·58 inches : this however at variance with the practical existing division of the guz measure, which is found on inspection to be divided into 24 parts ; what hesitation could there be, in referring it to the guz measures of Asia, of 24 tussoos, according to the second scale, divided into 28 parts, = 33·5206 inches English ?

Second, suppose another party, the tehseeldars of Moradabad, producing certain copper wires as counterparts of the actual measures from which their beegahs were formed = 33·50 inches on the average; another party delivering in the Ilahee guz of Akbar, ratified by Mr. Duncan, at Benares = 33·6; could there exist a moment's doubt that they represented the above measure of 24 tussoos? that the average measurement of 76 men's fingers' breadths = 31·55 inches; Mr. Newnham's (from the average size of 14 charyaree rupees), giving a measure = 29·20 inches: the testimony of inhabitants at Furukhabad = 31·50 inches: the $\frac{1}{2}$ sum of the diameters of 40 munsooree pice = 32·02; that one and all these are altogether fanciful, and untrue? Yet such questions are far from being unimportant, or of rare occurrence, and they secretly betray the skill, attention, and fidelity with which such inquiries are made on the one hand, the apathy or mistrust with which they are viewed by the people, as they themselves consider such inquiries of little, or of the greatest, consequence to their own immediate interests.

The foregoing I have had an opportunity of examining, from the accounts appended by Mr. James Prinsep*, Secretary to the Asiatic Society of Cal-

* This is the only scientific periodical in India, and it deserves a far more extensive circulation from the very able manner in which it is conducted by its present editor: to the learned in Europe it may be expected to prove of great utility in matters connected with the arts, sciences and literature of Asia.

cutta, to the Asiatic Journal, for June, page 89. Had the same industry been evinced throughout India, as in the case of the inquiries of Mr. Duncan, and Major Hodgson, we should not have to complain of the irreconcilable discrepancies which embarrassed the measures of the Revenue Boards and Government to no purpose.

FIRST SCALE ; divided into forty-eight parts :

Primitive standard, or unit, 48 parts or digits, = 39·09785 inches English, the mean length of the second's pendulum in latitude 45° ; at the level of the ocean, at the temperature of 39½° of Fahrenheit's scale.

Parts.	Inches English.	Correspondent or relative measures of other nations.
Unit,	48 39·09785	<i>A</i> Spanish vara, Persian arish, Arabian and Saracen ba,a. <i>B</i> The English or Saxon gyrd, or yard, properly speaking the Saxon ell of 45 digits, miscalled inches, 45 digits : 24 digits :: 36 inches : 19·2 inches, the length of the cubit thence resulting of 24 digits, which very nearly agrees with the ancient Norman, or French, = 19·3 inches. <i>C</i> Mogul and Tatar measures ; Rome, braccio di Mercanti ; the varas of Spain, Portugal, and dependencies.
	47 38·2833	
	46 37·4687	
	*45 36·6542	
	44 35·8397	
	43 35·0252	
The Kiskoo, or Arutnee of India,	†42 34·2106	
	41 33·3961	
	40 32·5815	
	39 31·7679	
	38 30·9524	
	37 30·1369	
Three quarters,	*36 29·3224	
	†35 28·5078	
	34 27·9933	
	33 26·8787	
	32 26·0652	
	31 25·2507	
	30 24·4362	

Parts.	Inches English.	Correspondent or relative measures of other nations.
	29 23·6213	
	+28 22·8068	
$\frac{1}{14}$; or ell,	*27 21·9918	<i>D</i> The braccio of Italy, Switzerland ; the rasi of Sardinia ; the ells of Cas- sel, Coblenz, Dresden, Cracow, Leip- sic, Riga, Heidelberg ; (the fourth of the Italian canna).
	26 21·1781	
	25 20·3625	
One-half, or cubit,	24 19·54892	<i>E</i> The cubit universally. Measures of Italy, Switzerland, France, (old system,) Lisbon, Russia, Morocco.
	23 18·7349	
	22 17·9198	
The rutnee of India,	+21 17·1053	<i>F</i> The measures, miscalled cubits, of Sweden, Germany, Russia, Austria.
	20 16·2907	
	19 15·4762	
	*18 14·6612	
	17 13·8467	
One-third, or foot,	16 13·0326	<i>G</i> The Chinese, Burmese, Siamese, Japanese, and Asiatic Islanders, foot measure.
	15 12·2181	
	+14 11·4034	<i>H</i> The foot measure of Genoa.
	13 10·5890	
One quarter, or span,	12 9·7745	<i>I</i> The palmi of Genoa, and the states of the north of Italy.
	11 8·9599	
	10 8·1453	
	*9 7·3306	
	8 6·5163	
	+7 5·7017	
	6 4·8872	
	5 4·0725	
	4 3·2581	
$\frac{1}{12}$ th, or palm,	3 2·4436	<i>K</i>
	2 1·6291	
$\frac{1}{18}$ th, or Digit,	1 0·8145	<i>L</i>

NOTE.—The letters refer to the details hereafter given, and the reasons for assigning each measure to those parts of the scale.

The asterisks (*) denote the connection or grouping of different national systems, by the division of the gyrd or yard, and ell, of 45 parts, or digits, into five portions of nine digits each.

The mark (+) denotes the connection or relationship of different national systems, by the division of the guz, or vara, or ell, or braccio, of 42 parts or digits, into six portions of seven digits each. This last had its origin in the second division of the scale into 28

parts, being three times 14, the number of divisions in the cubit, according to the second scale.

SECOND SCALE, *Amma Benoni*. The Architect's rule : divided into 28 parts.

Primitive standard or unit, *Ammah ha Reeshonah*, the sanctuary standard = 28 parts = 39·09785 inches English, the mean length of the second's pendulum, in latitude 45° , at the level of the sea, in the temperature of $39\frac{1}{2}^{\circ}$ Fahrenheit.

Parts or Tussoos.		Inches English.	Correspondent or relative measures of other nations.
Unit,	28	39·09785	<i>A</i> The Spanish vara ; the Persian arish, and Saracen, or Arabian ba,a.
	27	37·7014	
	26	36·3050	
	25	34·9088	
	*24	33·5125	<i>M</i> Guz measures of Asia ; varas of Spain, Portugal, the ancient Portuguese and Spanish dependencies of Majorca, the Canary Islands, Gibraltar, and the Colonies of those crowns.
	23	32·1161	
	22	30·7198	
$\frac{2}{4}$ ths, unit,=	21	29·3234	<i>N</i> The guz of Malabar, of the ancient Saxons, still in use in Wales ; the Russian arsheen ; the ells of Germany, Holland, and the Low Countries.
	*20	27·9271	
	19	26·5307	
	18	25·1343	
	17	23·7380	
	*16	22·3416	
	15	20·9453	
The half, or cubit,	14	19·54893	<i>E</i> The cubit universally.
	13	18·1525	
	*12	16·7562	
	11	15·3599	
	10	13·9645	
	9	12·5672	
	*8	11·1712	
$\frac{1}{4}$ th, unit,	7	9·7744	<i>O</i>
	6	8·3781	
	5	6·9820	
	*4	5·5856	
	3	4·1890	
	2	2·7928	
	1	1·3964	<i>P</i>

NOTE.—The asterisks (*) thus prefixed, shew the connection of the systems of different nations with the guz measures of 24 parts, which are subdivided into six portions of four each. The letters as in the preceding.

Secondly : The basis of the dry or liquid measure was the cube of the mean second's pendulum or primitive standard, divided exactly in the same manner as the lineal measure : that is, by two distinct scales,—into twenty-eight parts, for the convenience of taking the seventh, the fourteenth, the twenty-first, or twenty-eighth portion ;—and into forty-eight parts, more convenient for the halving and duodecimal division. These scales and their respective divisions, with their correspondent contents in English cubic inches, are as under.

The cube of the pendulum, the unit or basis of measures of capacity, according to the primitive system was = 59766·6107 cubic inches English measure.

The half of this unit $29883\cdot3053 = \frac{1}{2}$ the gerise or garce of Madras and Ceylon.

The quarter of this unit = 14941·6526. The true ancient English quarter.

The eight of this unit = 7470·8263 Indian ghunuhustu, the cube of the cubit.

The sixteenth of this unit = 3735·4131 Indian mun or pharra.

The thirty-second of this unit = 1867·7065 English bushel of Henry VIIth.

The forty-eighth of this unit = 1245·0377 Jewish bath or Epha of Scripture.

The coomb of England, and the *coombha* of India; the karrick of England, and the *karikia* of India; the *baha* of India, and the wey of England, occupy like places in this scale.

The second scale, or cube of the primitive standard, the mean length of the second's pendulum divided into twenty-eight parts. Cube of the primitive measure, or unit of measure of capacity for liquids and dry substances, 59766·6107 cubic inches.

Cubic inches.

The seventh part thereof, the French septier, 8538·0872

The fourteenth of the unit, 4269·0436

The twenty-first of the unit, 2846·0291

The twenty-eighth of the unit, equivalent to 2134·5218
or the English and Scotch bushel, (the bushel of Queen Anne.)

The *czetwer* of Russia, and the *tonnen* of Prussia, are the fifth of the cubic pendulum, = 11953·3221 cubic inches, the *années* of the south of France, the *anas* of India; the *razieres* of the lower Rhine, and the *ras* of India, are derived from this scale.

Thirdly: the basis of the primitive system of weights of whatever kinds was in all respects exactly the same as the above in principle, and represented by the weight of such portions of rain or distilled water, each cubic inch supposed to weigh 252·984 grains troy, at the temperature of 39·5° of Fahrenheit, at

the level of the ocean, in the latitude of 45° . It was divided also precisely in the same way, i. e. into forty-eight and twenty-eight parts.

FIRST SCALE ; unit of weight the cube of the mean length of the second's pendulum, 59766·61075 cubic inches \times 252·984 grains troy, = 15,120,000 grains troy, divided into 48 parts.

	Grains Troy.	lbs. av.		lbs. Rom.	Cubic inches.
Unit of weight,	15,120,000	2160		2880	59766·6107
One-half of unit,	7,560,000	1080	each lb. avoirdupoise of 16 ounces, each ounce 437·5 grains Troy.	1440	29883·3053
Quarter of unit,	3,780,000	540		720	14941·6526
Eighth of unit,	1,890,000	270		360	7470·8263
Sixteenth of do.	945,000	135		180	3735·4131
Thirty-2nd of do.	472,500	$67\frac{1}{2}$		90	1867·7065
Forty-8th of do.	315,000	45		60	1245·0377 the Bat.
1-6th of 1-48th of the unit.	52,500	$7\frac{1}{2}$		10	207·5065 the Hin.
1-24th of 1-48th of unit, or maneh of					
60 shekels,	13,125	1·875		$2\frac{1}{2}$	51·8766 the Kab.

Correspondent weights of other nations.

The forty-fifth part of the forty-eighth of the unit of weight, = 7000 grains troy ; one pound avoirdupoise represented by 27·6675 cubic inches of water. The sixteenth part of the forty-eighth of the unit of weight, = 5250 grains troy ; one pound of Italy, and Sweden. The two thousandth part of the unit of weight, = 7560 grains troy ; the pound of Scotland, France, Switzerland, Holland, and North of Italy.

The nine hundred and sixtieth part of the forty-eighth of the unit of weight, the English avoirdupoise or ancient Roman ounce, = 437·5 grains troy.

SECONDS SCALE ; unit of weight divided into 28 parts.

	Grains Troy.		Cubic inches.
Unit of weight,	15,120,000	2100	59766·6107
Seventh of unit,	2,160,000	300	8538·0872
Fourteenth of ditto,	1,080,000	150	4269·0436
Twenty-first of ditto,	720,000	100	2846·0291
Twenty-eighth of ditto,	540,000	75	2134·5218

Correspondent weights of other nations.

The hundredth of the twenty-eighth of the unit of weight, the ancient Saxon and Norman pound, = 5400 grains troy, = 5760 grains troy, minus three-quarters of an ounce. The seventy-fifth of the twenty-eighth of the unit of weight, the German pound, = 7200 grains troy; also the old commercial, or merchant's pound of fifteen ounces of England, = 7200 grains troy, which as well as the former of 5400, were abolished by statute in the 18th year of the reign of Henry VIII. A. D. 1527.

The ounce or the fifteenth part of the merchant's pound, = 480 grains. The existing English troy pound of 5760, derived from the merchant's ounce, or pound, being as 12 to 15, with respect to the latter, or $12 \times 480 = 5760$ grains troy.

The foregoing tables perfectly explain the origin of all the weights and measures of capacity, throughout the world, and set at rest many questions which have been proposed by the learned in Europe, regarding the origin of the troy and avoirdupoise pound. For as the septier and its multiples and aliquot parts came into England when the intercourse with France was greater, and when in fact a part of France was annexed to the crown of England, the correspondent weight, formed on the like principle and division of the scale, was introduced likewise: so that we had two systems of dry measures, and two of weights; the former, and much more ancient,

being the Roman of 12 ounces to the pound, each ounce $437\frac{1}{2}$ grains troy, each pound of 5250 grains; or of 16 ounces to the pound, each ounce of $437\frac{1}{2}$ grains, each pound of 7000 grains. So likewise in regard to the measures of capacity, we had the bushel and quarter of the first scale which were derived from, or transmitted down to the Britons and Saxons by their Roman conquerors, and the septier, minot, boisseau, and litron, introduced most probably in the time of Henry V., or it may be, some few years earlier.

It may be as well to shew in this place the origin of the ton, English weight, which is thus explained by Minshen, after Fleta, lib. 2, cap. 12th. "All our English measures are compounded of the penny sterling, which weigheth 32 cornes of wheat of the middle sort, and that two (2) of those pence make an ounce, and twelve ounces a pound in weight, or three score shillings in number, and that eight lbs. of wheat maketh a jalon, or gallon, as we now call it, and eight gallons a bushell, and eight bushells a common quarter; also that fifteen ounces of the quantity aforesaid doe make a merchant's pound, and that twelve such pounds and an halfe doe make a stone, and that fourteene stone doe make a waight, and that two waight, or eight and twentie stone, doe make a sacke of wooll, (which ought to weigh a quarter of wheat) and that twelve sacks make a last, and that a weight and a sarplar seemeth to be all one, but

that the sarplar is the case, and the waight respecteth the quantitie of the wooll itselfe, and that a load and a sarplar is all one." (Minshen, 11420, in Verbo Serplathe.)

The above passage is remarkable for its differing so materially in the account of the value or weight, of the old English ounce.

The ordinances of 51st Henry III. A. D. 1266, and 31st Edward I., merely repeat those of William the Conqueror, that the "English penny called a sterling, round and without clipping, shall weigh thirty-two wheat corns in the midst of the ear, and twenty pence to make an ounce, and twelve ounces one pound, and eight pounds do make a gallon of wine, and eight gallons of wine do make a London bushel, which is the eighth part of a quarter."

Now the basis of the whole fabric of the system of English weights, as Mr. Adams, Secretary of the United States, in his Report to the President, has correctly observed, was the ancient penny sterling, but not the silver: it was in short nothing more or less than the Jewish shekel, or standard of weight delivered down through the Romans. Two of these shekels by weight made the avoirdupoise or Roman ounce of 437·5 troy grains, and for this reason we are to consider the pounds of 5250 grains, and 7000 grains, also the ounce of 437·5 grains, to have been long in use before the pounds of 7200, and 5400 grains of the second scale; which were brought in by the Norman barons.

The word sterling refers to some ancient standard, as the Saxon term *steore* implies ; from whence it is derived rather than easterling, the name given to the Hanse Town and German merchant's fraternity, specified in the statutes of the 22nd year of Henry VIII. (being the principal or standing measure of the king, to the scantling whereof, all the measures thorow the land are, or ought to be framed, by the clerke of the market, Aulneger or other officer according to their functions). For it was established by the statute of Magna Charta, Anno 6, Henrie III. cap. 9th, that there should be but one skantlin of weights or measures thorow the whole Realme, which is sithence confirmed by Edward III. Anno 14, cap. 11, and many other statutes, as also that all should be fitted to the standard sealed with the king's seale." Setting aside therefore the many fanciful derivations of the word proposed by Skene, Linwood, Rapin, &c. we may be satisfied of its high antiquity from the statute of the 25th of Edward III. and although it is considered by Camden to allude to the Flemish workmen, introduced into Great Britain, in the reign of king John, who going usually by the name of Easterling Merchants, perpetuated their skill in minting, by the application of their proper designation to the coin of England ; it is far more probable that it came down from the time of Edgar, significant of some ancient rule, which was lost sight of, or confounded, with the appellation of the Flemish merchants. Through the Saxon word

steore, the Persian and Arabic *istar*, and the Greek *stateer*, (see Golius and Scapula sub verbis,) synonymous with the European shilling, the continental skilling; the Roman sicilicus, the oriental mishkol, and the patriarchal or Jewish shekel, we may trace it up to its true root, and find how exactly it was raised after the same principle: for in this 32 perootahs or garin (grains) = 1 maa or gerah; and 20 gerahs, = one shekel: so the English table was made to run thus, 32 grains make a pennyweight, (obolus;) 20 pennyweights one ounce; 2 shekels of commerce, one ounce.

It is probable the English ton weight was formed by the confusion of the Jewish stone of 14 lbs. two of which were reckoned equal to a quarter of a hundred pounds, and the commercial pound of the second scale of 7200 grains: for as we have shewn above, 640 grains were reckoned to the shekel: now $11\frac{1}{4} \times 640 = 7200$, to which adding 640 grains, we get 7840 grains, and this multiplied by 100, and divided by 28, gives 7000 grains for the heavy pound of the first scale: how liable persons are to fall into such errors might be better understood by the perusal of the statutes on this subject, within the last two hundred years in England.

The primitive money weight was the shekel of the sanctuary, called *khodesh shekel*; in contradistinction to the common or civil shekel, *kol shekel*; in the former case the shekel was double the latter, or one ounce in weight.

	Troy grains.
32 perootahs = 1 maa or gerah ...	= 21·875
320 perootahs = 10 do. = 1 beekah	= 218·75
20 gerahs = 1 shekel = 2 beekahs	= 437·5
60 shekels = 1 maneh	= 26 250
50 maneh = 1 talent or keekur,	= 1312500.

But the use of this was restricted to the temple. The *kol shekel* was half an ounce troy weight.

	Troy grains.
32 perootahs = 1 maa or gerah,	10·9375
10 gerah or oboli (<i>οβολοι</i>) one drachma, ...	109·375
20 gerahs = one shekel =	218·75
60 shekels = one maneh =	131 25
100 maneh = one talent of the sanctuary,	1312500.

This talent of the sanctuary was of twelve thousand drachmæ, or ten thousand Phillippics, or thick drachmæ of Corinth, each = $131\frac{1}{4}$ grains troy; but contained of its own, but 6000 beekahs.

The fourth part of the shekel, or the half of the drachma, was the deenar, = 54·6875 troy grains. The Phillippic, was the same coin as that specified in the 2nd of Ezra, called Darics, which weighed 12 gerahs each.

The *kol shekel* is first noticed in Scripture as current in the days of Abraham, 2053 B. C. being regularly stamped and coined, as we are led to infer from the Hebrew words, *Arba meoth shekel, kesef ober lassokher*, “four hundred shekels of silver, current money with the merchant.” Genesis, chap.

xxiii. verse 16th ; that is, $400 \times 218 \cdot 75$ troy grains. Here the money is spoken of and specially numbered as a coin ; the circumstance of its being weighed out, every one who has visited Asia, well knows is a practice of frequent occurrence even at this present day, especially in the reckoning of large sums, which otherwise must not only be tedious to a degree, but attended with great liabilities to error or fraud : in our public treasuries in India, it is always weighed out, or very seldom counted. Now the first money coined in Greece, the supposed centre of science and art, was not until 1100 years after, i. e. B. C. 895, when Megacles was Archon : for according to the Parian chronicle, translated by Hewlett, from Dr. Chandler's edition of that curious and valuable record of antiquity ; " During the reign of Megacles," it is said, " Phoidon the Argive was proscribed, and made measures and weights, and coined silver money in Ægina." The shekel of the sanctuary, *shekel hakkodesh* (*kodesh* " holy"), was of twenty gerahs : Exodus, chapter xxx. verses 13 and 24 : Exodus, chapter xxxviii. verses 24, 25, 26 : Leviticus, chapter v. verse 15 ; chapter xvii. verses 3, 25 ; Numbers, chapter iii. verses 47, 50 ; chapter vii. verses 13, 19, 25, 31, 37 ; chapter xviii. verse 16. This shekel in all these instances is most expressly distinguished by the affix *of the sanctuary*, " from that current with the merchant," Genesis, chapter xxiii. verse 15 ; or shekels " after the king's weight," 2 Samuel, chapter xiv. verse 26 ; wher-

ever the shekel pertaining to the temple, or dedicated to the service of the Lord is spoken of, it is with this adjunct, but no such distinction is elsewhere applied. It is a fair conclusion that it was as perfect in every respect, as the coins of the present day ; that in regard to form, impress, the due admixture of alloy necessary to its durability, it was calculated as a ready and just criterion of weight, no less than of a true and equitable standard of commercial value.

That the shekel of the sanctuary differed most essentially from the civil or commercial shekel, appears from a critical examination of certain passages of scripture : compare, for instance, the passage in the 17th verse, 10th chapter, 1st book of Kings, with the 16th verse of the 9th chapter of the 2nd book of Chronicles. From these we collect that three pounds or three hundred (*pieces*) of gold were employed in making each shield ; it is not said that they were *shekels* in the original, but *duhub*, gold. We may believe with great reason, that these pieces of gold were of the number presented to King Solomon, either by the Queen of Sheba, or the kings of Arabia, and governors of the country, wherefore being strictly an honorary present to a great earthly monarch, they were not distinguished in any more precise way. The narrative simply states, that three manehes of gold went to a shield, each such maneh consisting of 100 pieces of gold, that is, $\frac{13125}{100} = 131.25$ troy grs.

each. The practice of calling coins by the name of the metal, obtains very generally every where ; so in India, *hoon*, which signifies gold in Halla Canarese ; *roopuya*, silver, or a rupee ; the Grecian *καλλος* and *χρυσος*, the Roman *aureus* ; &c. This coin therefore forms a part of the second scale, being the same as the Philippic of 12 gerahs, exactly the ten thousandth part of the talent of the sanctuary, without supposing which to be raised from the shekel of the sanctuary of 437·5 troy grains, there would be a still greater difficulty in determining what coin to refer it to. Prideaux, and many learned commentators have argued that the Alexandrian drachma was double the Attic : whether this opinion be well founded, must be established from other than scripture data, for the Alexandrian Jews who made the Septuagint translation, would scarcely have thought of adding the expletive *το αγιον*, “the separated,” in their translation of the 30th chapter of Exodus, verse 13th and 24th ; had it been identically the same as the shekel of the sanctuary ; they would not have rendered *shekel hakkodesh* by *διδραχμα το αγιον*. In this, as in all other disputed passages, Scripture itself, is its own best and only interpreter. In the 17th chapter of St. Matthew’s gospel, verse 24 to 27, the margins of our bibles preserve the true rendering of the original Greek, *διδραχμα*, translated “tribute ;” and *στατηρ*, translated “a piece of money.” By a close adherence to the original Greek, and perhaps also a better term for the word

κηνσον, (capitation tax,) the nervous simplicity of the passage would be restored, and the meaning conveyed to every understanding, and thus, placed appositely with the septuagint version of the injunction in Exodus, prove, *primâ facie*, the intent of the Alexandrian Jews, to convey the full and strict meaning of the Hebrew. The tribute money to the Romans, was a tax levied independent of this didrachma, throughout all the conquered provinces, annexed, or subjected to the empire, and it is particularly noticed in two places of scripture; Matthew, chapter xxii. verse 17th, 19th; and Mark, chapter xii. verse 14th.

This was to all intents and purposes a tribute or acknowledgement of submission or bondage to a foreign yoke, κηνσον, assessed, or capitation tax, of a denarius, levied simply with reference to numbers, and not to the age of discretion, to which the persons enumerated had arrived, when they virtually acknowledged the *legal* ransom paid for their souls, and were then considered to be spiritually emancipated by the law. Josephus illustrates the nature and amount of this payment, (Jewish war, book 7th, chapter 6th, section 6th.) “Titus Cæsar,” (A. D. 71,) “also levied a tribute upon the Jews, wheresoever they were, and enjoined every one of them to bring two drachmæ every year, into the capital, as they used to pay the same to the temple at Jerusalem.” From a review of all these particulars, there can remain little doubt that the preceding statements of the

shekel of the sanctuary, and shekel current with the merchant, or after the king's weight, are substantially correct.

It may be judged by far the most curious to trace the same system, by examination of the Chinese, and Hindoo, and Arabian coins and weights : in these countries, the *mace*, the *massa*, and the *maa*, point out to the exact element corresponding to the primitive system. Take for instance the Hindoo ; the rule or definition in the shasturs, is twelve massas to the tola ; 28 tolas to the seer, or nearest weight corresponding to the pound : now ; $\frac{5250}{28 \times 12}$, or $\frac{437.5}{28}$, = 15.625 grains, which in fact is the exact weight of the massa deduced from the most ancient coins extant. Twelve of these constitute the weight of the tolah = 187.5 troy grains. Again, the true ancient *hoon*, or pagoda, is three and a half massas weight, = 54.6875 troy grains ; equal to half the drachma, of 109.375 grains. The gold *punum*, or fanam, is the tenth part of the ancient hoon, or pagoda, = 5.46875 grains troy.

The Mahommedans, adhering to the true standard pound of 12 ounces, or 5250 grains, have coined a hundred pieces of gold from the like quantity, whence the later hoons are found equal to $52\frac{1}{2}$ grains ; the later fanams $5\frac{1}{4}$ grains. I examined a large collection of coins and weights with much care, and found the agreement as near as could have been expected from the several mints. Other coins have

likewise been assayed and weighed by Mr. B. Noton, Assay Master at Bombay : Mr. H. H. Wilson, and Mr. Prinsep, Assay Masters at Calcutta : and Mr. Bannister, Assay Master at Madras : lastly by Mr. Bingley, and Dr. Kelly, in England, from specimens, or counterparts sent home in 1822.

To these may be added the names of Dr. Buchanan, and Mr. Heynes, who reported faithfully as far as their opportunities allowed, on those of the Madras territories.

From various sources the weight of the Calcutta Sicca Rupee is stated to be $12\frac{1}{2}$ massas, the weight 191·916, the massa therefore is $= \frac{191\cdot916}{12\cdot5} = 15\cdot3532$ troy grains.

The tola of Malwa, specified by Captain Dangerfield, to Sir John Malcolm, is 190 grains, and said to be of 12 massas ; the massa therefore $= \frac{190}{12} = 15\cdot8333$ grains.

The Kota pice in Malwa, $= 276\cdot6$ troy grains of 18 massas, hence the massa $= 15\cdot3666$ troy grains.

The Surat massa examined by myself, $= 15\cdot5435$ troy grains. The same examined by Mr Bingley, and Dr. Kelly, from the counterparts sent to England for examination in 1822 $= 15\cdot60$ troy grains.

The new Bombay gold-mohur, and silver rupee each of 180 grains, and $11\frac{1}{2}$ massa, hence the massa $= 15\cdot652$ grains troy.

The Madras coinage the same, the massa $= 15\cdot652$ troy grains.

The Calcutta gold-mohur, weighing 204·71 grains, divided by 13·28152, the number of massas contained therein, gives for the massa, 15·413 grains troy.

From a very large collection of coins and weights examined by myself, on the western coast of India, and the Mharatta federal states, the general average was 15·6078 grains troy.

From the copper coin, named at Madras the *Dub*, (Heynes' Statistical Reports,) corresponding to the pice of Kota in Malwa, of 18 massas = 275 grains troy, which gives, $\frac{275}{18} = 15·277$ grs. for the massa.

From the heavy weights of the Mharatta states submitted to my examination, of 24, 26, 28, and 72 tolas, the average massa was 15·573 grains troy.

The average massa of the gross weights of the late Peshwa's dominions, of 72 tolas, was 15·972 grains troy; the tola being 191·66 grains, at Ahmudnuggur, Sungunneer, Unkola, Kotool, Rajoor, Kurmul-la, Kurda, Indapoor, Jooneer, Poona, and Dhoolia.

The Jaulna masha = 15·373 grains; the Ahmudnuggur massa, = 15·7; the Malwa massa, = 15·833; the Poona massa, 15·97: (according to Kelly's Cambist.)

The average of several gold and silver jilalees of Akbar's reign, found in good preservation, gives 15·5 grains for the masha: according to Mr. James Prinsep, Sec. As. Soc. Calcutta.

A gold jilalee of Lahore, rather worn, 186·6 grains, according to Prinsep, which he takes to be $12\frac{1}{2}$

massas, but is more probably the tola of 12, each massa of 15·55 grains troy.

The ancient hoons of the Mysoor and Anagoon-dee kings have nearly disappeared, the punums are more common : the modern hoons average 52·5 grains.

These instances suffice to prove the correspondence of the Hindoo to the universal system. The names are not entirely lost, as I found in the *Wydhya-grunth*, a Hindoo treatise on medicine, (or the Hindoo medico-incantation art,) which as usual is prefaced with tables of weights and measures, the tunku, (better known by its corrupted names, *tank*, *tuk*, or *tack*.) is there called dhurum, khan, kol, and nishk, by which last term the quantity is more familiar to the Brahmins, and frequently used in their shasturs ; 2 tunku, = 1 kshoodrum, drukshum, or uwut ; one tunku, = 4 massa ; and 3 tunku, = 12 massas, = one tola : 6 massas, = one gudyana, a weight well known in Cutch, and Sinde, and the territories bordering on the mouths of the Indus ; here dhurum and drukshum are evidently clumsy corruptions of the Greek drachma, or the Arabian dirhem ; the *massa*, nishk, and kol, are words of Hebrew or Arabic original ; the disjointing and transposition of the syllables, and the mistake of the letter *n*, for *m*, gives nishk and kol, mishkol, (the shekel weight,) Ezekiel, chapter iv. verse 10th.

It may be proper to notice that the discrepancies of existing weights, measures, and coins have been

supposed much greater than they really are, from inattention to the division or fundamental elements : a guz of 42 digits, or a guz of 27 digits, would probably give the measure of 24 digits, conformable to the truth : a guz of 24 tussoos, of 20 tussoos, or of 18 tussoos, would give the cubit of 14 tussoos, pretty nearly alike, however widely those lineal measures might differ in respect of their absolute lengths : the rupee of 12 , $11\frac{1}{2}$, 11 , or $10\frac{1}{2}$ massas might, by ignorant persons, be called a tola, yet the massa would be very nearly alike in all : and so of the measures of capacity and heavy weights, there are correspondent parts or elements which prove incontestibly a reference to some one common principle, which had been lost sight of, in the lapse of ages ; and that principle, the very one which we have now been investigating. From a review of the subject it is obvious that nothing has so obstinately resisted deterioration as this, nor does any branch of legislation so forcibly declare the futility of innovations dictated by private judgment, or the peculiar interests of any one nation in particular : a law of this nature, to be efficient and permanent, must be universally operative and acceptable.

We may now consider the nature of the other measure, which entered into the construction of the molten sea, equal to twenty-one inches, eight hundred, and seventy-five thousandths English, nearly ; which according to received opinion, is of Egyptian, or some may say, of Chaldean origin ; but the infinitely

greater probability is, that it was first communicated to the Egyptians by the patriarch Joseph, because it forms an essential part of the patriarchal scheme ; the honorary title, moreover, by which Joseph was distinguished by Pharaoh, implies also a revelation of some hitherto unheard-of methods, calculated to ensure the most perfect and just distribution of the lands, produce, and revenues of Egypt, and to perpetuate the same, as well to the full term of that prince's days, as to all future ages. Genesis, chapter xli. verse 45.

Now the collection and amount of the revenues of Egypt, which is exclusively irrigated by the annual overflowing of the Nile, is determined by the height of the inundations : to which intent, a standard measure called *mikyās*, or the nilometer, was erected by Joseph, somewhat more than commensurate with the full quantity necessary to the fertilization of all that tract bounded by Syene and Elephantina. This for its peculiar richness of soil, for the certainty and abundance of its crops, was well called "the granary of the world." The *mikyās*, or nilometer, was divided into twenty parts : Bruce measured this monumental standard with every practicable precaution, and found it $36\frac{1}{2}$ feet high, which gives for each twentieth part, or measure, 21·9 inches English, more or less : these measures are again subdivided, each into 24 others, with the exception of the lower two, which are plain.

The nature of a distribution whether of land or revenue, dependent on such phenomenon, precluding, as it necessarily must, every ordinary method of computation or definition, called forth the ingenious device in question, which served to maintain a permanent rule of equity—accessible, simple, intelligible, to all, and as we may infer from its acceptance and perpetuation, superior in every respect, to any that had been resorted to, or could be expected. Whence, having been introduced and used time immemorially in Egypt, it obtained the name of the Egyptian peek, *πηχυς*, arbitrarily rendered cubit, by Europeans, as conveying the idea of some sort of relationship to the natural *cubitus*, or fore-arm, because forsooth the Hebrew word *ammah* admitted of such double interpretation, and this last mentioned was one of them.

It is plain, from inspection of the divisions of the primitive standard of 39·09785 inches, into 48 or 28 parts, that the measure of 21·8746 inches, does not fall into any even place of digits in either scale. Indeed, the design or use of it was exclusively directed to the just distribution of lands and produce, as far as we can judge from what precedes. Its more full and appropriate intent, however, was the simple expression of measure connected with the earth's dimensions, that is, with the measure of the earth's circumference, or the measure of a degree, and the superficial extent, whether of the whole globe, a single degree on its surface, or any portion.

To this end, a lineal quantity was selected, equal to the two hundred thousandth part of a degree on the meridian, in the latitude of 45° ; or the seventy two millionth part of the earth's meridional circumference $= 21.874675179$ inches English. Thus

$$\frac{21.874675179 \times 200.000}{12 \times 6}, = 60762.986 \text{ fathoms, re-}$$

presents the mean length of a degree on the meridian, or the length of one degree, in latitude 45° .

The patriarchal or Jewish itinerary measure, was the 24,000th part of the earth's meridional circumference, each such itinerary measure, or bereh, as it was called, that is, a mile, or *meel*, being equal to 3000 measures; the measure itself, therefore, the 72,000,000th part of the earth's meridional circumference, or $\frac{131248051.0764841044}{72,000,000}$ feet, $= 21.874675-$

179 inches. That this was the identical primitive mile, is discernible in the very imperfect allusions to the systems handed down to us by the Greeks, Egyptians, Chaldeans, and Romans. The tables of the latter for instance, furnish us with a clue to the present argument: for the *mille passus*, or mile, was an itinerary measure of 1000 paces, 5000 feet, or 80,000 digits, there being 16 digits to the foot; therefore $\frac{16 \times 5 \times 1000}{3000}$, or $\frac{80,000}{3000}$, $= 26.666+$ digits, the length of the fundamental measure of the patriarchal, or Jewish bereh.

Now the forty millionth part of the earth's meridional circumference is to this fundamental measure precisely as 48 to 26·666 digits; or, as 9 to 5, or 72 to 40: not to the digits of the Roman cubit, but to the digits, or 48th parts of the forty millionth of the earth's meridional circumference: it has been insisted on, as an indispensable precaution to remember that this essay supposes the word *digit*, purely conventional, and so also, here.

In the absence therefore of more direct evidence, the adaptation of the detached elements, the tables and nomenclature of all other nations, to one great universal consistent system, deducible as from the passages of scripture now under investigation, we are best to adjudge to whom to ascribe the prior and most perfect acquaintance with its real scientific character.

According to Professor Airy's Essay on the Figure of the Earth in the *Encyclopædia Metropolitana*, quoted by Sir J. Herschel, *Astronomy*, chapter iii. p. 117, the curve of the earth's meridional circumference is supposed to be an ellipse, and the lengths of the axes, "which best agree on the whole, with the entire series of meridional arcs, which have been satisfactorily measured, are as follows,

"Greater or equatorial diameter = 41,847,426 feet = 7925·648 miles.

"Lesser or polar diameter = 41,707,620 feet = 7899·170 miles.

“ Difference of diameters, or polar compression, 139,806 feet = 26·478 miles.

“ The proportion of the diameters, is very nearly that of 298 : 299, and their difference $\frac{1}{299}$ of the greater, or a very little greater than $\frac{1}{300}$ *.”

Now putting E for the equatorial diameter, and P for the polar: also the ratio of the circumference to the diameter of a circle, as 3·1415926535897932384 to 1, or as c to 1, then $\frac{E+P}{2} \times c + \frac{c}{2} \sqrt{\frac{E^2+P^2}{2}}$, will express the circumference = 131248051·07648410-440446 feet: the seventy-two millionth of which, expressed in inches, is the measure used in the calculation of the content of the molten sea, from which the primitive lineal standard, or mean length of the second's pendulum at the level of the ocean in latitude 45°, at temperature of 39½° (in vacuo) was derived, and with which therefore it is necessarily combined, as forming an integral part of one system.

From a comparison of the Lapland, British, French, and Indian surveys, the ellipticity, or ratio of the polar to the equatorial axis of the earth, 304

* It is not the least remarkable proof that the figure and dimensions of the earth given by Professor Airy are correct to an extraordinary degree of exactness, that the earth's surface computed by the most precise formula, and divided by the mean superficial degree, gives 3692162451·41 fathoms, the square root of which is the length of the degree on the meridian in latitude 45°, and exactly the same as 200,000 Jewish measures.

to 305, has been found to agree very nearly with that deduced from the lunar theory, of $\frac{1}{305}$, computed by Laplace, and the length of a degree on the meridian at the equator, from a comparison of the same data may likewise be considered equal to 60458 $\frac{1}{16}$ English fathoms. Admitting this to be the true amount of compression, and the radius of curvature at the equator, $R = \left(\frac{60458 \cdot 1 \times 113 \times 366}{355 \times 2} \right)$. = 34639936 fathoms, the length of the polar radius P, will be equal to $\left(\frac{R \times 305}{304} \right)$; and the length of the equatorial radius E, = $\left(\frac{R \times 305}{304} \right) + \left(\frac{R \times 305}{304^2} \right)$: that is, $P = 34753883 \cdot 91$, = $\left(\frac{305 \times 34639936 \cdot 75}{304} \right)$; and since $\left(\frac{R \times 305}{304^2} \right)$, = $\frac{P}{304}$, = $\left(\frac{34753883 \cdot 91}{304} \right)$, = 1143 54·9, the length of the equatorial radius, becomes $\left(114354 \cdot 9 + 34753883 \cdot 9 \right)$, = 34868238·8 fathoms : hence the length of a degree, in latitude 45°, = 60756·9 fathoms, consequently the meridional circumference 21872486·067432 fathoms ; wherefore the two hundred thousandth part of a degree, as above, or $\frac{60756 \cdot 9057428 \times 6 \times 12}{200,000}$, or its equal, the seventy two millionth of the meridional circumference, = $\frac{21872486 \cdot 067432 \times 6 \times 12}{72,000,000}$, = 21·872486 inches English.

The result of this computation differs about two hundred and nineteen hundred thousandths of an inch from that assumed as the true measure of the nilometer, or the molten sea : strictly, $21\cdot874675179 - 21\cdot872486 = \cdot002189112$ inches, which is sufficiently near to exemplify the difference depending on this or that assumed ellipticity, or compression. So also, if it be taken according to Lambton, $-\frac{1}{310}$, the degree on the meridian in latitude 45° , is $60751\cdot8$ fathoms, which would give $21\cdot870648$ inches English, for the two hundred thousandth part of the mean degree, or seventy two millionth of the whole circumference. Again, if we follow Lalande's compression, $\frac{1}{300}$, the length of a degree on the meridian in latitude 45° , is $60780\cdot29$ fathoms English measure, the two hundred thousandth part whereof is equal to $21\cdot8809$ inches English : from all which, it may be concluded with very great reason, that whenever the results obtained from the trigonometrical operations, undertaken in various parts of the earth, the lunar theory, the precession, nutation, and lastly, but more especially, the vibrations of the pendulum, shall be reconciled on the strictest mathematical principles, and concur to establish one uniform law of compression, to this, as to every other planet, we may then expect a perfect solution of a question which before hand we know to be founded in fact, but of which at present, we can hope only for an approximation.

To revert therefore to the remaining parts of our inquiry, itinerary and superficial measures. These may be defined in two several ways: the former, either with respect to the entire meridional or equatorial circumference of the earth, the mean length of a degree on the meridian, the equator, or the earth's polar, or equatorial axis; or lastly, the mean length of the second's pendulum throughout the earth, at a temperature commensurate with that of the greatest density of water, the measure of weight: the latter, or superficial measure with reference to the entire superficies of the globe, the superficial extent of the mean degree, or by means of the primitive standard or pendulum, in length and breadth, regulated as respects temperature, according to the foregoing rule. Such in fact, are the elementary principles of the itinerary and land measures, in all antiquity, from one or other of which all are undoubtedly derived.

First: itinerary measures derived from the earth's meridional circumference, or mean length of a degree on the meridian, in latitude 45° . The patriarchal or Jewish bereh, equivalent to the 24,000th part of the mean degree on the meridian; or in other words, 3000 measures of 21·874675179 inches, = 5468·668 feet, or 1822·889 yards: whence, Thales, Anaximander, Aristotle, successively, and long after them, Hipparchus, B. C. 140, derived their first opinions of the earth's dimensions, though they one and all, not only supposed this elliptic body to be a perfect sphere, which would occasion a very sensible altera-

tion in the necessary elements, but *doubted* of the truth of their informants, and suggested a better account, from their own fertile imaginations. The ancient Jewish or patriarchal parsah, or Arabian fursukh, the Grecian παρασάγγα, and Persian fursung, are three times the above measure ; that is, 16406·004 feet, or 5468·668 yards, and these continued to be the received itinerary measures with all civilized nations down to the days of the Arabian Khalif Alnamoon, though it must not be supposed, the principle was not therefore at any time perverted, or misunderstood, by the philosophers and speculative rhetoricians of Egypt and Greece, by Sanchoniatho, Berossus, and Aristotle, or their respective followers. Throughout the Turkish dominions at this present, the original itinerary measure of the 24,000th part of the earth's meridional circumference is still preserved under the name of berree, the same by which it was known to the Jews of old : and we may thus, by help of the first notices of the earliest heathen writings now extant, on the subject of the earth's dimensions, trace the gradual rise of all those contradictory statements which originated in a perversion, or misunderstanding of the original simple and comprehensive system of the patriarchs, till in short it was so mixed up with speculative reveries and astrological fictions, that in the days of Mamoon it became a serious question whether it had any real foundation in truth, being thenceforward replaced by the new and approximative experiment-

al measurements which do so much honour to the memory of that distinguished prince, and which were generally received from that period in all countries but Egypt and Turkey, where they subsist to this day.

The Greek philosophers in their wanderings had gained some little insight into these matters ; whether from the Egyptians, Chaldeans, or Indians, is an infinitely more conjectural idea than that they acquired it from the Jews, or other descendants of the patriarchs ; but whatever they may have learnt in this way, was a mere fragment of some simple and consistent scheme, to which, perfectly unconscious of its real value, they applied their own reasonings or fallacies with the exact degree of success that will ever attend the airy castles of theoretic speculation. Hence, Meton, Calippus, and Hipparchus, obtained celebrity for a more precise knowledge of the luni-solar cycles : Pythagoras, Democritus, and Eudoxus, for an acquaintance with the order and harmony of the planetary system, the existence of telescopic planets, as Mercury, and Saturn ; and in like manner, Anaximander, Thales, Hipparchus, and Ptolemy for a more just conception of the earth's dimensions, the obliquity of the ecliptic, the precession of the fixed stars, and the first elements of geography. But it is admitted on every hand, by astronomers, particularly by the most illustrious of the present day, that in all their writings there is a singular and unaccountable mixture of the most sublime

truths with irrational and inconsistent opinions, that do great discredit to their authors, if they constitute not a still stranger presumptive ground of doubt, whether these Grecian sages were indeed the discoverers of the arcana, which themselves maintained. What opinion in short is to be formed of this strange complication of truth and error, but that the former was either received, or borrowed, or surreptitiously appropriated, without acknowledgment, and so falling into the hands of persons perfectly incompetent to the estimation of its merit, was destined to the usual fate of ill-gotten wealth, to be soon lavishly wasted or deteriorated, to be descanted on from age to age, to be transmitted to posterity in a still more mutilated or disguised form, till its scattered fragments scarcely retained any one point of resemblance to the grand system whence they were derived.

Thales, B. C. 610, or his disciple Anaximander, appears to have furnished the statement to the Aristotelian school which that philosopher has given in his 2nd book de Cœlo: "All the mathematicians who have attempted by reasoning to discover the earth's circumference, affirm that it is 400,000 stadia." Mr. Delambre is of opinion that this remark of Aristotle neither establishes the true measure of the stadium itself, nor any real measure of the earth by ancient observations: estimating the circumference of the earth as stated, at 400,000 stadia, the stadium would be about 328 feet; which is considerably less than the

length generally assigned. It is worthy of remark that the four hundredth part of this stadium agrees exactly with the computation which I had deduced from the Soorya Siddhant, reputed to be the most ancient and correct astronomical book extant amongst the Hindoos : the length of the *nulwu*, translated furlong by Colebrooke, according to Amera Sinha, is 400 hustu or cubits. This cubit (so called), comes out = 9·84 inches ; not by following their mode of reckoning, or we might suppose the Hindoo account to have been the production of as early an age as Aristotle, but by referring the Hindoo and Grecian data to actual experiments, or to the primitive patriarchal system. That is, in either case, these Hindoo and Grecian data, when submitted to either of these tests, give exactly half the measure resulting from actual experiment, while they professed, both one and the other, to give the full measure. It is to be presumed therefore that the Greeks were the real authors of this blunder in the first instance, which furnished the writers or compilers of the Poorans with the ground-work of the fable, that the circumference of the earth is 50,000 yojuns, for this is the reckoning at 8 *stadia*, or *nulwu*, to the yojun, an itinerary measure of 3200 cubits, conforming to that of Eratosthenes, Cleomedes and Posidonius, which was derived from their estimate of 252,000 *stadia* or furlongs to the circumference ; each stadium of 320, or probably 400 cubits ; the mile, or *μικλιον*, in both cases, being 3200 cubits in length ; the

cubits in all the foregoing instances being the measures so called.

Domin. Cassini supposes Eratosthenes to have been the first geometer who had recourse to celestial observations, in order to determine the magnitude of the earth; and indeed the passage cited from Aristotle would seem to imply, that up to his time, 346 B. C. the ancient philosophers of Greece and Egypt, had merely speculated on the probability of some accounts received, or learnt, he knew not whence, or how. The measure of Eratosthenes, B. C. 210, was 700 stadia to the degree; that is, in round numbers, or 252,000 stadia for the whole circumference. Posidonius and Cleomedes computed it in like manner. Hipparchus, the prince of astronomers, as he is styled, B. C. 140, and after him, Ptolemy, A. D. 140, made it 8000 parasangs, 24,000 miles or 180,000 stadia; the *παρασαγγα* of $22\frac{1}{2}$; the *μilion* of $7\frac{1}{2}$ *σταδία*, or furlongs, each of 3000 measures. This latter opinion of Ptolemy referred most probably to some anterior geodesic operations between Racca, on the borders of Mesopotamia, and the celebrated "Tadmor in the wilderness," afterwards called Palmyra, where Solomon built a magnificent city and palace.

This last measurement was repeated by the Arabian Khalif, Al Mamoon: it had been reckoned by the earlier writers of that nation equal to 24,000 *meel mullikeen*, but Mamoon assigned 20160 *meel*, of 4000 *uswud dirxa*, or black cubits, as they are

designated by Musoodee, the author of the *Mooroojood Duhub*, or “Pastures of Gold,” epitomized by De Guignes, from a copy in the library of the king of France. All these measurements are considered by modern mathematicians to be more or less fictitious, or at best, but rude guesses. This appears to be the judgment of Mr. Delambre, as far as relates to that recorded of Eratosthenes. The distance from Alexandria to Syene, was reckoned to be 5000 stadia, which Eratosthenes had found to be contained under an arc of $7^{\circ} 12'$, on the terrestrial sphere, wherefore without adverting to the sun’s true parallax, or the allowances due to refraction, he concluded this distance to measure also the fiftieth part of the earth’s circumference. The circumference, at this rate, should have been 250,000 stadia; the degree of $\frac{5000}{7.2} = \frac{50000}{72}$, or 694.444 stadia; to obtain the length of a degree of 700 stadia in round numbers, he assigned 252,000 stadia, to the circumference, and *in this very fact*, we have the strongest assurance that Eratosthenes never did measure the terrestrial arc, for the first was the true, the latter the incorrect account of the matter, as will be seen from what follows.

The Patriarchal bereh = 3000 measures, $= \frac{1}{24000}$

of the earth’s circumference; the whole meridional circumference therefore $= 72,000,000 \times 21.874675179 = 131248,051.076 +$ feet. The Parsah, = three

bereh, or $\frac{1}{8000}$, of the earth's circumference. The Jewish *khebel*, or stadium = 400 measures. Aristotle's stadium = $\frac{1}{400000}$ of 72,000,000 measures, or 180 measures; but 180×21.874675179 , = 3937.441518 inches; that is, in other words, 100×39.37441518 inches. By Eratosthenes' account, the stadium was $\frac{1}{250,000}$ of 72,000,000 measures; or in other words, 288 times 21.874675197 inches, that is, 6299.906428 inches; which is precisely equivalent to 160 times the measure deduced from Aristotle's stadium, or 160×39.37441518 inches = 6299.906428 inches. In this preliminary investigation, we see the derivation of the measures of Aristotle and Eratosthenes from some one common statement, or their mutual agreement with it, and with each other: but 6299.9064288 inches, or 87.4987 fathoms, multiplied into 694.444 stadia to the degree, gives 60762.98 fathoms, precisely the same as the patriarchal, = $\frac{21.874675179 \times 200,000}{6 \times 12}$ = 60762.98 fathoms. It can scarcely be affirmed after such explanation, that either of these philosophers appreciated, or in short, had the slightest comprehension of the subject, or they would never have suggested a preferable statement of their own: nor could Cleomedes and Posidonius have adopted such statement, had they known the real merits of the question delivered down by Eratosthenes. The subsequent ac-

counts of the latter are therefore to be considered mere unpretending transcripts of the error of Eratosthenes, for the stadium by his own shewing, was $\frac{1}{252,000}$ of 72,000,000 measures, or, $285.714 \times 21.8746751$, = 6249.9009 inches, or 173.6083 yards. How this was devised we may learn from the subsequent operations of Mamoon, for this prince either introduced, or it may be revised, the itinerary measure of Egypt, as he reckoned 20160 miles to the circumference of 4000 cubits each, (of the lineal standard,) there were 252,000 stadia or furlongs to the mile of 320 cubits each, the mile of ten such stadia, being 3200 cubits of the lineal standard ; and thus, by the abuse of the nomenclature and the confusion of tables arose all the contradictory opinions which disfigure and perplex the writings of the Heathens.

The itinerary measure of the Greeks and Romans instanced by Herodotus, Xenophon, Ptolemy, Diodorus, Strabo, Pliny, Quintus Curtius and others, of 30 stadia to the parasanga ; of 10 stadia to the mile ; of 300 measures to the stadium, as well that of Ptolemy of $\frac{1}{180,000}$ of the circumference, or $\frac{72,000,000}{180,000}$, = 400 measures $\times 21.874675179$ = 243.05194 yards, were all borrowed in like manner from the patriarchal system ; and these, with the exception of the Roman *mille passus*, embrace all the authentic itinerary measures of antiquity. The Roman *mille passus*, as we have before shown, was nothing more than

a misunderstanding of the patriarchal *berēh* ; for $\frac{16 \text{ digits} \times 5 \text{ feet} \times 1000 \text{ passus}}{3000 \text{ Jewish measure}}$, gives 26·666 digits for the length of each Jewish measure, and this stood in the ratio of 26·666 to 48, with respect to the forty millionth of the earth's meridional circumference ; that is, 48 digits : 26·666 digits :: 39·37441518 : 21·8746751 inches. The basis of the Egyptian, Chaldean, Greek and Roman itinerary measure, was the unit of the patriarchal scheme, that is 39·37441518 inches, the forty millionth of the earth's meridional circumference, to which the element of the patriarchal itinerary measure stood in the relation of 5 to 9 ; this last being the 200,000th of the mean length of a degree on the meridian in latitude 45°, or the 72,000,000 of the earth's entire polar circumference. Why the division by 48 or 28 was selected, remains to be explained, if it be not that these numbers presented the most commodious scales for general use ; but the money weight of 60 shekels to the maneh, is remarkable for its affording greater facilities of sub-division than any other whatever ; that is, taking either 10, or 12, or 100, or any other number soever, its multiples excepted, it was capable of division into more parts : for instance, the half, quarter, third, fourth, fifth, sixth, and so forth, could be taken, and with these fractions the deficient fractions made up ; hence it is found to constitute a remarkable feature in the patriarchal tables of time, of 600 luni-solar years, which peculiarities

may possibly incline geometers to defer the division of the circle into six times the radius, or chord of 60 degrees, and the entire circumference of 360 degrees to the same source. The wisdom of the Chinese may be inferred from their discarding this simple division of the circle for that of $365\frac{1}{4}$ degrees : the French division, into 400, has probably undergone a sufficient ordeal in the fire of time to disprove its claims to supplant the ancient rules, but even these facts may weigh with many in behalf of the division we have so long been accustomed to follow, and which has the prescriptive right of so many thousand years' practical utility.

We have brought down the itinerary measures to the beginning of the Christian era. In the declining years of Rome, the fourth great monarchy of the world, literature and science dragged on slowly, after all that was celebrated in story, of that once powerful empire. From the time of Augustus, virtue and military prowess, and reputation for wisdom, were distinctions that subsisted only in the ideal greatness of Rome, and the records of past ages. The incursions of the Goths and Vandals aroused the nation to a sense of its fallen condition, and in a few years, the barbarians of the north were put in possession of all that constituted the empty title to such pre-eminence. It was long before they perceived the value of their acquisitions, and when Italy had in some degree recovered its energies, the Arabians had far out-stripped the scholars of the west in the career of intellectual glory.

Mamoon at the beginning of the tenth century of the Christian Æra, surpassing his father the celebrated Haroon-ool Rusheed, a name familiarly associated with eastern tale, in the accomplishments which then began at the termination of the Saracen conquests to distinguish the camps and courts of those destructive hosts, was at once the devoted patron and cultivator of every branch of learning. Pursuing the surest methods of investigating truth, by the abandonment or mistrust of every thing that was grounded on mere hypothesis or assertion, he diligently consulted the laws of the material world by experiment, and in the inductive analysis of such inquiries, arrived at the hidden foundations of that rational philosophy, the full development of which, at the interval of eight or nine centuries, has conferred lasting celebrity and honor on a Bacon, a Newton, and a Laplace.

Under the instruction of a Christian physician, by name Mesua, Mamoon assembled at his seat of government in Khorassan, many learned men, of all persuasions indiscriminately, Jews, Christians, and Mahomedans, for the better understanding and diffusion of his favorite pursuits, Astronomy and Mathematics more especially. In his passion for knowledge he entirely overlooked the bigotry of his creed, and evinced a spirit of toleration which was of singular advantage to the promotion of knowledge, although it gave great occasion of umbrage to his father. But he was soon relieved from uneasiness on this score,

by the death of Haroon-ool Rusheed, whom he succeeded in the Khalifat of Bagdad, in the 194th year of the Hegira, A. D. 809, being then only 23 years of age. Mamoon's predilection for literature and philosophy, contributed to raise him in the estimation of the best and wisest of his subjects, perhaps even in a less degree, than his clemency and justice in the opinion of the most lawless : for these qualities while they overawed, corrected and humanized the spirit of military adventure which glowed with unabated fervor in the breast of every Saracen soldier. A few years before his death, he caused Ptolemy's *Almagest* to be translated, which for a considerable period was the only knowledge we had of that work : with unparalleled industry and impartiality, he collected, arranged, and digested the scattered remnants of science that could then be obtained, at any expense or trouble, assisted in such research by the illustrious family of Moosa bin Shaker, Moohummud, Ahmud, and Alhazen. He determined the obliquity of the ecliptic to be $23^{\circ} 33' 52''$. His attention was directed in the next instance to the magnitude of the earth, and other useful problems of a similar nature.

Two parties, the one headed by Khalid bin Abdool Mulik Murwuroodee ; the other, by Alis bin Eesa Oostroolabee, measured a line under the same meridian, one party proceeding directly on the meridian, northerly ; the other south of a central position, in the opposite direction ; either as some relate, near Bhooyu Sinjar, in the neighbourhood of Moosul, the

ancient Nineveh ; or, as others affirm, in the desert of Sinjyar, a dependency of the province of Diarrabia in Mesopotamia, until they found the altitude of the pole differ one degree from its altitude at the place of departure. The one assigned 56 Arabian *meel*, the others $56\frac{2}{3}$ to the length of a degree ; the mean of these accounts, according to Mussoodee, was assumed as nearest the truth ; Aboolfeda says 56. Another Arabian author, of whose work I obtained an extract by the favor of a learned Parsee priest in Bombay, Moolla Firoz, states that each result was rather less than 19 fursukh, (*tuqreebun*, that is, approximating to, but in defect ;) now $56 \times 360, = 20160$ miles, each of which was of 4000 cubits, (*uswaa' :*) but the mean was something more, or 56.333 miles to the degree. Aboolfeda cites Ibn Kalikan, as we may see in his annals translated by Pococke, as his authority for these particulars, and that the ancient or patriarchal mile was of $66\frac{2}{3}$ to the degree, the circumference itself $66\frac{2}{3} \times 360, = 24000$ *meel*. The Arabian *meel* of Mamoon was therefore increased in the inverse ratio of 2016 to 2400. From the circumstantial detail of the operations, we have no reason to doubt the fact of its execution by the parties, as represented, neither of their acquaintance with the division of the circle into 360 degrees, the true ratio of the diameter to the circumference, nor the still more remarkable formula, or rule, for the exact computation of the earth's superficies : in all such indications of genuine experiment

and originality, the statements of the Greeks, Egyptians, Chaldeans, Hindoos, and Chinese, are altogether deficient*. The Arabian narratives make no

* *Abulfedæ Annales, Tom. II. page 241 to 243. Latine reddit. a Pococke.* “Eodem obiit Muhammed, filius Musæ, filii Schakeri, unus trium illorum fratrum, de quibus artes et inventiones mechanicæ filiorum Musæ in famam et proverbium iverunt, duo reliqui Ahmed et Hosain audiebant. Tres hi fratres magno cum studio et ingenti animo veterum philosophorum scientias excolebant, in primis geometriam, mechanicam, et musicam. His viris olim usus fuit Mamun ad explorandum terræ verum ambitum: didicerat enim ex antiquorum sapientium libris ambitum terræ viginti quatuor millia milliarium efficere. Cujus rei quo certior fieret, dabat his Musæ filiis in mandatis, ut, quantâ possent, maximâ curâ et diligentîâ in ejus rei veritatem inquirerent. Hi terras sibi dari poscunt in vastam porrectas planitiem, adeoque aptissimas observationibus instituendis; auditoque, desertum Sengarense, item humilius apud Cufam solum huic rei per-opportunum esse, proficiscuntur in planitiem Sengarensem, cum additis a Mamuno fidis inspectoribus et administris, qui observationes summâ cum circumspectione et fide peragi curarent, et peractas fuisse principi fidem facerent. Ibi diligenter quæsitâ inventâque poli elevatione, ad palum ibidem defixum alligant funem longissimum, et versus septentrionem primum, lineâ, quantum soli permittebat indoles, rectissimâ minimumque aberrante procedunt. Funis ubi desineret, ibi alium alii palo humi pariter depacto alligabant, donec id iterum iterumque repetendo, pervenirent ad locum ubi elevatio poli septentrionalis uno exactè gradu increverat. Id remensi spatium deprehenderunt, sexaginta sex milliaria, cum duobus milliarii trientibus conficere. Reversi ad locum, unde in septentrionem procedere cœperant, directe versus austrum procedebant, primo palo funem, et ita porro alios aliis alligantes, iisdem prorsus modis atque institutis, quibus antea versus boream procedentes, usi fuerant; donec tandem ad

parade of such knowledge, but introduce it casually as dependent on certain established mathematical processes: but by far the most ingenuous avowal, is that this geodesic operation of Mamoon professed no inventive stretch of genius, or novelty of thought, that it simply contemplated the verification of certain particulars derived from ancient books, which were proved to the perfect satisfaction of the prince and his coadjutors, by the mutual congruity of the several performances of the different parties with each other, and with the ancient observations. It is immaterial to the question, that the length of the

locum devenirent, in quo elevationem poli septentrionalis uno grade humiliorem esse observabant. Id rursus emensi spatium rursus invenerunt sexaginta sex milliariū esse cum gemino triente milliarii. Quibus peractis reduces Mamuno rationem sibi observatorum reddunt: qui, rei quam certissimi fieri posset, explorandæ ergo, Cufam eos mittit, ubi iteratis iisdem rationibus, quas in agro Sengarensi instituerant, quum eandem ibi pariter atque illic summam calculi darent, ad Mamunum renunciarunt: qui sic relationes, et hujus et ex antiquis libris haustæ veritatem planissime perspexit, ambabus observationibus cum vetustis, tum suis, exacte inter se congruentibus. Multiplicabant deinde sexaginta sex, et quod excedit, cum 360, quot sunt gradus orbis cœlesti, unde confecta viginta quatuor milliariū millia. Hæc ita hæctenus retuli ex Ibn Chalicani et aliorum historicorum fide; quos tamen dubio vacat in eo falli, quod existimant Mamuni tempestate inventum fuisse, sex et sexaginta milliaria cum gemino triente unicuique gradui competere. Tantundem enim numerarant veteres in gradum: at Mamuni tempore observatum fuit, gradus singulos non habere nisi quinquagena et sena milliaria. Id quod demonstratum est in astronomicis."

degree was not determined with the exactitude of modern science: the methods to which Mamoon had recourse were theoretically correct, the instruments however, with which the experiments were conducted were much too rude to give results nearer the truth than those of 56 , $56\frac{1}{3}$, or $56\frac{2}{3}$ Arabian meel : it may be observed in this place, that the extremes differed exactly one eighty-fifth of the contained arc.

The tide of conquest and migration effected an early diffusion of the science and literature of the Arabians throughout the whole of Asia; the Tatars applied them to their legitimate uses, but the Hindoos and Chinese surreptitiously appropriated them for a very different object. The priesthood availed themselves of every thing they could lay their hands on, or comprehend, to aggrandize themselves in the eyes of the multitude, by the fabrication of a very plausible scheme of chronology and astronomy, embracing periods of time beyond the utmost comprehension of sober reasoning. The rise of this system of priestcraft, both in China and India, which had hitherto eluded the research of Bentley, Wilson, Colebrooke, and Sir William Jones, has been satisfactorily traced to the 607th year of the Christian era, but this is no fit place to state the proofs, which belong to a distinct inquiry ; the astronomical fictions were framed subsequent to the propagation of the existing religions of the worshippers of Brahma and Fo ; on the introduction of these astronomical fictions it became necessary to remodel their chronology.

The Hindoo shasturs, it must be admitted by their most strenuous advocates, speak as little for the consistency and penetration of their Reeshees and astronomers as for their morality and wisdom : in the articles of imagination and morality indeed, they are gross and degraded beyond those of all other idolatrous nations. Their astronomical works furnish us with the first proof of this appropriation of Arabian science : to elucidate this fact is easy, and may be sufficient for the present argument. These works differ widely in the measure assigned to the earth's circumference ; according to seven of the eighteen Siddhants, held most in repute, the diameter and circumference are as follows : Sooryu Siddhant, the oldest and most esteemed treatise, the circumference = 5059, the diameter = 1600 yojuns : according to the Siddhant Shiromunee of Bhaskur Acharyu, the circumference = 4937, the diameter = $1581\frac{1}{14}$ yojuns : according to the Lughoo Vasishta Siddhant, the circumference = 4966, the diameter = 1581 yojuns : according to the Siddhant Shekhur, the circumference = 5000, the diameter 1581 yojuns : according to the Sarwu Bhoom Siddhant, the circumference = 5026, the diameter 1600 yojuns : according to the Lullu Siddhant, the circumference = 3300, the diameter = 1050 yojuns : lastly, according to the Arya Siddhant, used in the south of India, the circumference is equal to 6625 yojuns. These citations are sufficient to show that the Hin-

doos are not agreed, as is generally affirmed, in the matters which they severally maintain to have been revelations from a higher source; but for the confirmation of the present point at issue, we may discuss the merits of those dimensions stated in the Sooryu Siddhant, which is reputed to have the precedence of every other Hindoo treatise of Astronomy, both in antiquity and accuracy. The original passage is thus closely rendered: "The diameter of the earth is twice 800 yojuns. The square root of ten times the square of that sum is the earth's circumference." That is, numerically, $800 \times 2 = 1600$; which squared, $= 2560,000$; this multiplied by ten $= 25,600,000$, the square root of which is 5059·64425 yojuns, or 5059 yojuns, 2 kos, 1154 dundas, and since the Hindoos divide the circle, (*vrith* or *wurtool*,) into 360 parts or degrees, (*ounsh*,) the three hundred and sixtieth part of the circumference is equal to one degree, $= \frac{5059 \cdot 64425}{360} = 14 \cdot 05459$ yojuns, or multiplying it by 4, there being 4 kos to a yojun, $= 56 \cdot 21828$ kos in a degree, which corresponds as nearly to the measurement of Mamoon, as the empirical ratio of the diameter to the circumference might lead us to expect. From a review of this, and the several statements, two things are manifest, that the Hindoos did not know the true ratio of the diameter to the circumference, which they have reckoned variously: in the foregoing instance, as, 1 to 3·162277; an

approximation or guess, for aught we know to the contrary, unsupported by mathematical proof; and next, that the account in question was borrowed, because it does not agree with the practical system of measures which prevail all over India, and which the Hindoo shasturs inform us is equally ancient. These books inform us, little adverting to the purpose to which the information would one day be applied, that the kos is a measure of 8000 cubits; supposing this to be true, and the statement in the Sooryu Siddhant original, $8000 \times 56 \cdot 21828 = 449-746 \cdot 24$ cubits, should represent the length of a degree, and the length of the cubit, computed from this,
$$\frac{60762 \cdot 9 \times 6 \times 12}{449740 \cdot 24} = 9 \cdot 7 \text{ inches English; exactly}$$
 the half of the cubit of 14 tussoos; or 24 digits, throughout all parts of India, because forsooth it is purposely disguised to preclude the detection of the plagiarism. It is well known that Mr. Davis has asserted in the Asiatic Researches, in an essay on the Astronomy of the Hindoos, that as the radius in the table of sines found in the same book, but a few lines further on, is made to consist of 3438 equal parts or minutes, of which equal parts the quadrant contained 5400, this implies a much more accurate knowledge of the ratio of the diameter to the circumference, viz. 1 to $3 \cdot 14136$, but this only serves to corroborate the opinion of the Hindoos being mere copyists at second hand from the Arabians and Greeks, for what could possibly be a more palpable indica-

tion of plagiarism, than to find a false rule placed side by side with another that is true, and both mixed up in all sorts of ways, in the calculations of eclipses, the positions of the planets, and so forth, as the production of one author, let us not so grossly abuse the appellation, as to call him a *mathematician*? Again, for the second difficulty, on examination of the table, we discover a nearer ratio even than the foregoing, and why not have used the true length of the radius, 3437.74² are they not the inventors of the decimal scale !! But if they be not entitled to that honor, at least they have elsewhere resorted to the ancient practice of taking up fractions by multiplying the whole number into the denominator of the fractions, as in the case of the great year, computed from a complete revolution of the equinoctial colure. Mr. Delambre has entered into a long and learned defence of the Hindoo table of sines in the *Connoissance des Temps* for 1808, page 447 ; notwithstanding, having entirely overlooked the former objection, namely, the previous mention of an untrue ratio, the case must necessarily stand by itself, to be judged as the production of another author.

The Chinese have likewise availed themselves of this same measurement by the Arabian Khalif Ma-moon ; the Jesuits Martini, Noel, Parennin, Gaubil, and Verbiest, have left us sufficiently detailed particulars in that strange medley the *Lettres Edifiantes*, from which to judge of the merits of the proficiency of the Chinese in science. Pere Gaubil reports, that

their ancient astronomers measured several arcs of the meridian, in order to determine the number of *li* to a degree. Under the Emperor Huien Tson, who is said to have reigned from the year of our Lord, 712 to 756, one of the greatest astronomers in China, by name Yhan, measured several spaces on the plains of the province of Honan, which lie almost entirely south of Hoanho, or the yellow river. The first of these, by the difference of observed altitudes, of $29\frac{1}{2}$ minutes of latitude, was found to be 168 li, 179 pu; another of $29^{\circ}50''$, contained 167 li, 241 pu; a third arc of $28^{\circ}34''$, contained 160 li, 10 pu. In which it is to be noted, that in these differences of latitude, the graduation is reduced to the European, from that in use among the Chinese, for they divide the circle into $365\frac{1}{4}$ degrees, analogously to the division of the solar year, and assign therefore to the graduation of the meridional arcs between the equator and poles, $91\frac{5}{16}$ degrees: though the practice has probably fallen into disuse, with many other such fanciful devices, since the introduction of the Jesuits into the Chinese tribunal of mathematics. From the first of these, he concluded the degree, or three hundred and sixtieth part of the circumference, to be equal to 340 li: from the second, 338 li; from the third, 336 li.

The results of a similar operation carried on about the year 1000 of the Christian era, gave, as we are told, by Danville, from the memoirs of the Chinese re-

ported by the Jesuits, one thousand li to three Chinese degrees of latitude, which reduced according to the foregoing graduation gives 338·278 li for each degree, or the three hundred and sixtieth part of the circumference. That is, 3 Chinese degrees : 365·25 Chinese degrees :: 1000 li : 121750 li ; the 360th part whereof, = 338·278 li : what other data Danville may have had to obtain these results, does not appear, but the numbers 340 ; 338 ; and 336 ; are exactly in the same ratio as the measures of Mamoon ; $56\frac{2}{3}$, $56\frac{1}{3}$, and 56 : hence the li comes out = 1000 Arabian feet, and six li, 4000 Arabian cubits, (each of 19·4022 inches English,) for $\frac{4374497\cdot2134816 \times 360}{1217\cdot50 \times 1000}$ = 12·93486 inches English. As the Arabian astronomers were divided in their estimate of 56, and $56\frac{2}{3}$ Arabian meel to the degree, or the 85th part of the contained arc ; so also, the Chinese and Hindoos demurred on this very same point, which in the absence of more direct evidence must be considered a very notable proof of their being all one and the same account.

To this epocha also we may trace the introduction of itinerary measures into European countries conforming more or less to the Arabian and patriarchal. The itinerary measures of the Tatars, Huns, Moguls, Saracens, are of Arabian origin ; and are found in Spain, Portugal, Morocco, Russia, Persia, and according to the injunctions of the Mahommedan sovereigns, in India likewise. The old system of the French was a measure of 2000

toises, or 12,000 feet, or 8000 primitive cubits of 19·32 inches, the very same as the Hindoo kos. The Spanish legua of 8000 : the Portuguese of 5000 varas, or guz of 24 (tussoos), parts of the second scale, or division of the primitive standard into 28 parts : the kos established by the Emperor Akbar in Hindoosthan, also of 5000 guz, of the same length, (24 tussoos,) the measure of England, = 8 furlongs of 400 cubits, or 3,200 cubits of 19·8 inches.

It now remains only to show the origin of the superficial measures of antiquity, and their connection with the scientific elements of the patriarchal system. From the testimony of Herodotus, Josephus, and the historians cited by him, in his discourse against Apion, we learn that the measure called the *apoupa* was common to the Greeks, Egyptians, and Jews ; it was a square of 100 measures, = 4785014·4 inches, or 3692·1 square yards, which was equivalent to the four-millionth part of the mean superficial extent of a degree on the earth's surface. By dividing the whole surface of the earth, therefore, which for the present argument we may suppose equal to 196,862,256 square miles, as it is said to have been determined by Laplace, or its corresponding area reduced to square yards, = 609,800,524,185,600, by the number of square degrees, we have

$$\frac{609,800,524,185,600}{E P c} \times \left(1 + \frac{1 \times E^2 - P^2}{6 P^2} - \left(\frac{E^2 - P^2}{40 P^2} \times \frac{E^2 - P^2}{P^2} \right) + \&c. \right)$$

= 14765529391·33 square yards, the four millionth

part whereof, $= (100 \times 21.87242)^4$; and the square root, supposing the degree a perfect square, 60756.7 fathoms*. But whatever elements are had recourse to, we shall find the differences between the four millionth part of the total number of degrees on the earth's surface, to be too inconsiderable to affect the quantity, or area of the *aroura*, beyond the last figure. Suppose, for example, the length of the degree in latitude 45° , $= 60762.986$, as derived from the Jewish ; or from a comparison of the British, Lapland, Indian, and French surveys, $= 60756.9057428$; or with Lambton, 60751.8 ; or, lastly, with Lalande, 60780.29 fathoms, the measure or superficies of the *aroura*, will be in each of the several cases as follows :

	Sq. Yds.
From the Jewish computation of the earth's surface =	3692.1
From a comparison of European and Indian surveys =	3691.4
From Col. Lambton's Indian survey,	3690.78
According to Lalande,	3694.0
According to the account given as Laplace's in Barlow's Mathematical Dictionary,	3695.6

The elementary measure, as we have shown, was the 200,000th part of a degree on the meridian, in latitude 45° , in the exact ratio of 5 to 9, with respect to the forty-millionth of the whole polar circumference ; for this last being 48 digits, or for the sake of illustration, so divided, $26\frac{2}{3} : 48 \text{ digits} :: 80 : 144$ or as 5 : 9, that is, in each of the foregoing instances,

* I have computed the earth's surface according to Professor Airy's statement of the axes before mentioned, the earth being considered a regular oblate spheroid $= 609,919,391,835,634.919$ square yards.

1st. The forty and seventy-two millionth of the first or Jewish will be,				
2nd. From comparison of European and Indian surveys,				
3rd. According to Lambton's survey,				
4th. According to Lalande's computation,				
5th. Laplace's as above deduced from the surface,				
6th. According to the French survey,				
	The seventy-two millionth		The forty millionth of the earth's polar circumference.	Inches.
		21°874675		39°37441
		21°872486		39°37047
		21°870648		39°36716
		21°8809		39°3856
		21°87242		39°37035
		21°872664		39°37079

The next most remarkable land-measure was that of 100 cubits each way, or 10,000 square cubits of the primitive standard, which was equal to the five millionth part of the mean superficial degree, or nearly so, therefore in the ratio of four to five, with respect to the aroura. For example (19°54893 inches $\times 100$) squared = 2948·77 square yards, five million times which area gives 14743850000·0 square yards for the mean superficial degree, and for the total surface of the earth, 608,895,510,000,000 square yards : by using the computed surface of the earth, said to be that of Laplace, the result differs immaterially being $\frac{609,800,524,185,600}{41298255 \times 50,000}$ square yards, = 2953·1 square yards.

This superficial land-measure, of ten thousand square cubits, is readily identified with the Roman jugerum, the candetum of the ancient Gauls, specified by Columella, the Persian jureeb, and the beegah of Hindoosthan. Columella (*de re rustica*, lib. 5, cap. 1) : tells us that the candetum, a land-measure used by the ancient Gauls, was 150 feet each way, or in other words, it was square of 100 cubits, by the reduction of the former in the ratio of 3 feet to 2 cubits. Varro and Columella describe the Roman

jugerum as a superficial measure, 120 feet by 240 feet, (Roman account,) that is, reduced in the ratio of three to two, of 80 cubits, by 160 cubits or 12,800 square Roman cubits ; hence by analogy we obtain the correspondent cubit, one hundred of which, being squared, represent also the same superficies, $\sqrt{12800}$: $\sqrt{10,000} :: 17\cdot4$ inches (the assumed length of the lineal measure called by the Romans a cubit): $19\cdot68$ inches ; or thus, 240 times $11\cdot6$ inches English, (the length of the Roman foot, according to Dr. Greaves,) $\times 120 \times 11\cdot6$ inches English, = $387\cdot5328$ the square root of which, is $19\cdot68$ inches.

The Persian jureeb is a measure of 50 arish squared, the arish agreeing with the primitive standard, or twice the primitive cubit. The Indian beegah is a measure of 20 gunthas, kottahs, vansas or kathees, each way, the length of such land-measuring rod in Hindoosthan proper, and all India north of the Nurbudda, being of five cubits, (the Indian cubit agreeing by experiment with half the primitive standard of the sanctuary,) consequently a square of one hundred cubits each way. Besides

* Here it should be observed, that the difference of temperature at which the standards are taken by Professor Airy in his measurements of the earth's axes, will compensate for the difference between the measures of superficies computed from his data and the primitive standard, the four millionth of Professor Airy's mean degree would be $3692\cdot1$ square yards ; the five millionth equal to $2953\cdot73$ square yards: the double of the hundredth of the square root of the latter is $39\cdot1307$ inches.

these, there are other land-measures in India of 80 cubits squared, or 6,400 square cubits also of $5\frac{5}{8} \times 20$ or $116\frac{2}{3}$ cubits squared, or square cubits, but these as far as I can learn, are found only to the south of the Nurbudda, which river divides Hindoosthan from the peninsular countries to the south of it, distinguished at some remote period by one general name, the Dukhshun or Dukhun (south).

The measure of the Persian King Noorshirwan, under whose reign the Arabian prophet Mohummud was born, was a square of 60 kissery guz, or 3600 guz ; it was introduced into India by the Emperor Akbar, and is noticed by Sir John Malcolm in his Memoir of Central India, as the prevailing land-measure of Malwa : these as we learn from historians were novel inventions of those sovereigns, they were of 11,025 square cubits. The English acre which was fixed by statute in the 33rd and 34th year of the reign of Edward the First, is a measure of 16,000 square cubits, or a square of 400 cubits : the cubit 19·8 inches, as before. The French arpent ordinaire of the old system, 900 square toises, or 14,400 square cubits ; the cubit supposed equal to 19·2 inches. The arpent royale, 12,100 square cubits, the cubit itself the same as the preceding. The Scottish acre regulated by the elwand, established by King David the First, and kept in the council of Edinburgh, being to the English, as 7869 to 10,000 or 1259 to 1600 ; supposing the English and Scottish measures of the cubit the same : it was ten

times the square of 24 elwands, or 5760 square elwands: but this last measure being found on examination to contain $37\frac{1}{2}$ inches English, and representing a measure of 45 digits, when reduced in the ratio of 24 to 45, gives 19.84 inches for the cubit, the Scottish acre therefore by this would be 20,250 square cubits.

Having adduced sufficient instances in proof of the fact that all itinerary and superficial measures referred either to the measure derived from the earth's dimensions, or to the primitive standard, it remains only to be observed, that it is impossible, without the most perfect data, to say whether any or what relationship exists between the measure derived from the earth's superficies, or its circumference, and the pendulum vibrating seconds in a mean solar day; but in the analogy of the land-measure, founded on the latter to the Aroua, there would seem to be some grounds for its reality, because these areas are in the ratio of 4 to 5, nearly, and the hundredth of the square root of the Aroua to the forty millionth of the earth's circumference is as 5 to 9: agreeable to this, the mean length of the second's pendulum would be to the former as 5: $\sqrt{20}$, or the three hundred and sixty millionth part of the earth's meridional circumference into the square root of 20; the forty millionth, and seventy-two millionth, being respectively denoted by $9a$, and $5a$, the second's pendulum by a $\sqrt{20}$: computing for example with the French data; first, the

forty millionth of the earth's periphery = $39\cdot37079$ inches English, which reduced in the ratio of five to nine is $21\cdot872664$; this last squared, and reduced to square yards, is $3691\cdot461654$, which reduced in the ratio of four to five, the analogy of the superficial measure of 100 cubits squared, to the square of 100 times $21\cdot872664$, is equal to $2953\cdot16932381$ square yards; the square root of which divided by 100, and multiplied by 2, is $39\cdot127010$ inches; this supposes also the mean superficies of a degree = $14,765,840,000$ square yards, and the total surface = $609,803,990,000,000$ square yards.

Since the laws of gravity which regulate the lengths of pendulums, and the descent of falling bodies, describing certain spaces in certain times, or in fact, the ratio of the force of gravity, that is, of a heavy body falling through half the length, to the times of oscillations of any pendulum, are strictly analogous to the ratio of the diameter to the circumference of a circle, why may not the same, or some very similar relationship be expected to subsist, between the length of a pendulum which vibrates seconds or other portions of time, and a mean measure of the earth's dimensions expressed in terms of such pendulum, considering the earth to be strictly as an oblate spheroid?

In this essay, there is sufficient argument to dissuade those who cultivate science from pronouncing hastily against any passage of scripture, though the solution of its difficulties be far from obvious. In-

numerable indeed are the truths of a far less abstruse nature, which are immeasurably removed from those who will not be at the pains to examine them : inasmuch also, as the test to which we submit any observation is imperfect, the inference must be in a like degree unsound. Secondly, to repel, or rather disprove the mere assertion, that the Egyptians, Chaldeans, Indians, Chinese, or the philosophers of Greece originated so much as one new idea, unless evidence to the fact can be produced from their writings, or such other indications as usually accompany and mark the progress of genuine discovery. Thirdly, to shew that the most enlightened sages of antiquity, Pythagoras and his school ; Thales, Aristotle, Eratosthenes, Archimedes, Hipparchus, Ptolemy, and their disciples respectively ; and last in order of time, the Arabians and Tatars, with their copyists, the Chinese and Hindoos, were altogether indebted for the few imperfect hints which they had picked up from age to age, from the Jews, in this department of mathematics. Finally, to illustrate the universality and simplicity of the scriptural scheme of metrology, which combines unity of design, with great and peculiar recommendations to its acceptance, of which it cannot be judged the least, that it embodies the very choicest elements which have been selected as the ground-work of the French and English systems. Added to this, is the singular advantage of experience ; as to the practical working of the original principles, in the teeth of human devices for their

annihilation or alteration. The system we have investigated, although sadly defaced, is not yet entirely demolished ; it still towers triumphantly over every other throughout the world, as a venerable and glorious ruin, to be restored perhaps to its former grandeur by those very nations whose aim and interest are as inseparable, as their existence and glory are co-extensive. In presenting this sketch of a very singular and ancient structure, and digging its remains out of the mass of rubbish and weeds which had been accumulating around it for ages, it can hardly be thought a reproach to have failed in pointing out some excellencies, or to have escaped some erroneous impressions. Whether the ratio of the length of the second's pendulum to the earth's meridional circumference be any thing better than a mere approximation to the truth, a point indeed, which if proved, would be chiefly important as it affected the probability that science came originally by inspiration ; it may safely be affirmed, that the chances are infinite against any two or more particulars agreeing so very nearly with experiment by mere accident, more especially when such particulars are determined with respect to the complicated schemes of metrology, of kingdoms and people separated from each other, not only by vast intervals of time, but of civilization and space. It were equally repugnant to sound reason and historical testimony moreover, to conclude, that an explanation of all those difficulties which are no otherwise to be removed in

regard of the metrological systems of all other nations, should be incidentally given in a statement which strictly fulfils the preceding conditions, according to the uncompromising test of mathematical argument, and, no less unanswerable that the Jewish nation must have possessed a perfect understanding of all the details on which it was founded : that their acquaintance with it must have been long antecedent to that of the Egyptians, Chaldeans, Indians, Greeks, and Chinese, who otherwise could not have been so unwise as to question its truth, differ about its application, or betray their own narrow-mindedness and ignorance in attempting to substitute a false one in its room, neither can it be doubted that they would have declared the grounds of their opinions, or suffered them in some shape to transpire, had they any of their own, or even a clear apprehension of them from others, at second hand, to produce to the admiring world. Lastly, no less remarkable and instructive is the sum of the whole argument, that mathematical science was, some five thousand years ago, but little short of its present perfection, with respect to that branch of it now under discussion ; admitting that no better case can be made out in regard to others : that it has declined with the decline of true religion ; that the energy, yet more the sobriety ; the freedom, yet much more the restraints which its returning light has inspired, has operated to dispel the delusive dreams of the dark ages of superstition, to remove the veil of

intellectual and sensual idolatry, to increase our happiness, to enlarge our views, to meet our wants, to subserve, in short, the great end of our existence, in proportion as we lean not on our own limited understandings, but advert *first* and *last* to “ the Giver of every good and every perfect gift.”

F I N I S.

APPENDIX.

[NOTE.—The following is the passage from Babbage on the Decline of Science, referred to in the Preface, page viii.]

“The singular minuteness of the particles of bodies submitted by Dr. Woollaston to chemical analysis, has excited the admiration of all those who have had the good fortune to witness his experiments; and the methods he employed deserve to be much more widely known.

It appears to me that a great mistake exists on the subject. It has been adduced as one of those facts which prove the extraordinary acuteness of the bodily senses of the individual—a circumstance which, if it were true, would add but little to his philosophic character; I am however inclined to view it in a far different light, and to see in it one of the natural results of the admirable precision of his knowledge.

During the many opportunities I have enjoyed of seeing his minute experiments, I remember but one instance in which I noticed any remarkable difference in the acuteness of his bodily faculties, either of his hearing, his sight, or of his sense of smell, from those of other persons who possessed them in a good degree. He never showed me an almost microscopic wire, which was visible to his and invisible to my own eye: even in the beautiful experiments he made relative to sounds inaudible to certain ears, he never produced a tone which was unheard by mine, although sensible to his ear; and I believe this will be

found to have been the case by most of those whose minds had been much accustomed to experimental inquiries, and who possessed their faculties unimpaired by illness or by age.

It was a much more valuable property on which the success of such inquiries depended. It arose from the perfect attention which he could command, and the minute precision with which he examined every object. A striking illustration of the fact, that an object is frequently not seen, *from not knowing how to see it*, rather than from any defect in the organ of vision, occurred to me some years since, when on a visit to Slough. Conversing with Mr. Herschel, on the dark lines seen in the solar spectrum by Fraunhofer, he inquired, whether I had seen them; and on my replying in the negative, and expressing a great desire to see them, he mentioned the extreme difficulty he had had even with Fraunhofer's description in his hand, and the long time which it had cost him in detecting them. My friend then added, I will prepare the apparatus, and put you in such a position that they shall be visible, and yet you shall look for them, and not find them; after which, while you remain in the same position, I will instruct you *how to see them*, and you shall see them, and not merely wonder you did not see them before, but you shall find it impossible to look at the spectrum without seeing them.

On looking as I was directed, notwithstanding the previous warning, I did not see them; and after some time, I inquired how they might be seen, when the prediction of Mr. Herschel was completely fulfilled.

Temperature of the Maximum Density of Water.

An elaborate memoir by Professor Hälloström, on the specific gravity of water at different temperatures, and on the

temperature of its maximum density, has appeared in the Swedish Transactions for 1823. It is divided into two parts: the first contains a critical discussion of the results, and the methods employed by preceding experimenters; the second, a detail of an extensive course of experiments, instituted by himself, with a view to the more accurate determination of this important but difficult inquiry. The method of experimenting which he regarded as the most accurate, and which he therefore adopted, was to ascertain the weight of a hollow glass globe, very little heavier than water, and about $2\frac{1}{4}$ inches in diameter, in water of every degree of temperature between 0° and 32.5° centig. The errors arising from a dilatation or contraction of the glass, the weight of the atmosphere, &c. were all calculated, and a corresponding correction made. The result was, that water attains its greatest density at a temperature of 4.108° cent. (39.394° Fahr.); and the limits of uncertainty occasioned by the impossibility of ascertaining the dilatation of glass with perfect accuracy, he estimates to be 0.238° (0.428° Fahr.) on either side of this number.

The two following tables exhibit the result of his experiments on the sp. gr. of water in all temperatures between 0° and 32° centig. In the first, the sp. gr. at 0° ; in the second, the sp. gr. at 4.1° is taken as the unit.

Temperature.	Specific Gravity.	Temperature.	Specific Gravity.	Temperature.	Specific Gravity.
Cent.		Cent.		Cent.	
0°	1.0000000	10°	0.9998906	21°	0.9983648
1	1.0000166	11	0.9998112	22	0.9981569
2	1.0000799	12	0.9997196	23	0.9979379
3	1.0001004	13	0.9996160	24	0.9977077
4	1.00010817	14	0.9995005	25	0.9974666
4.1	1.00010824	15	0.9993731	26	0.9972146
5	1.0001032	16	0.9992340	27	0.9969518
6	1.0000856	17	0.9990832	28	0.9966783
7	1.0000555	18	0.9989207	29	0.9963941
8	1.0000129	19	0.9987468	30	0.9960993
9	0.9999579	20	0.9985615		

Temperature.	Specific Gravity.	Temperature.	Specific Gravity.	Temperature.	Specific Gravity.
Cent.		Cent.		Cent.	
0	0.9998918	10	0.9997825	20	0.9982570
1	0.9999382	11	0.9997000	22	0.9980189
2	0.9999717	12	0.9996117	23	0.9977300
3	0.9999990	13	0.9995000	24	0.9974000
4	0.9999995	14	0.9993922	25	0.9970387
4.1	1.0000000	15	0.9992647	26	0.9967107
5	0.9999959	16	0.9991260	27	0.9963439
6	0.9999772	17	0.9989752	28	0.9959504
7	0.9999472	18	0.9988125	29	0.9955264
8	0.9999044	19	0.9986387	30	0.9950917
9	0.9998497	20	0.9984534		

The uncertainty which still exists respecting the temperature of the maximum density of water may, perhaps, be best illustrated by a table of the results, which he brings successively under review.

Observer.	Calculator.		Observer.	Calculator.	
		Cent.			Cent.
De Luc,	Biot,	3.129	Charles,	Biot,	3.999
	Ekstrand,	3.60		Paucker,	3.88
	Paucker,	1.76		LefevreGineau,	4.44
	Hällström,	1.76		Hällström,	4.35
Dalton, ..	Dalton,	2.22	Bischof,	Bischof,	4.06
	Biot,	4.35		Rumford,	4.38
Gilpin, ..	Young,	3.89	Tralles,	Rumford,	3.47
	Biot,	3.89		Tralles,	4.35
	Eytelwein,	2.59		Hope,	3.33
	Walbeck,	0.44		.....	3.88
	Hällström,	3.82		.....	4.16
	Eytelwein,	2.91		Ekstrand,	3.60
	Hällström,	8.63		.....	3.90

Before commencing his investigation, Prof. H. determined in the first place the dilatation of the glass which he employed in the course of his experiments. His results, particularly in the two extremes of temperature, differ considerably from those of Lavoisier and General Roy; on which account, we consider it worth while to insert them here."

Temperature.	Expansion.	Temperature.	Expansion.
Cent.		Cent.	
0	0.000000	60	0.00496
10	0.00030	70	0.00652
20	0.00181	80	0.00829
30	0.00153	90	0.00927
40	0.00246	100	0.001245
50	0.00361		

See *Annals of Philosophy*, for February, 1825. page 155.

“ Of all liquids, that which has been most carefully and most minutely examined with respect to its dilatation, and which presents the most striking exception to the general law of expansion, is *water*. All the methods which have been explained have been applied to this liquid, and all concur in proving, that as its temperature is lowered towards the point at which it is converted into a solid, its contraction does not proceed in the same uniform manner as the general law would lead us to conclude. As its temperature is lowered, the rate at which it contracts is observed to diminish, until it arrives at about $39\cdot2^{\circ}$ of the common thermometer. Here all contraction stops, and if the temperature be lowered, it is observed, that neither contraction nor expansion takes place for some time; but, presently, on lowering the temperature still more, a dilatation is observed to be produced, instead of a contraction; and this dilatation continues at an increasing rate, until the water is frozen.” “ It appears, therefore, that water has a point of maximum density, and that that point is at the temperature of about $39\cdot2^{\circ}$ Fahrenheit. Different philosophers have determined the point of greatest condensation, and the results of their investigations very nearly agree. Sir Charles Blagden and Mr. Gilpin fixed it at 39° . Lefevre Gineau, by very accurate experiments, fixed it at nearly 40° . More recently, Hällström arrived at a similar result. Experiments, performed by Dr. Hope and Count Rumford, agree in fixing the point of maximum density between 39° and 40° . The experiments of Hällström fix it at $39\cdot38^{\circ}$. For a few degrees above and below the temperature of greatest condensation, the dilatation of water is found to be the same. Thus, at 1° above and 1° below the point of greatest condensation the specific gravities of water are the same, in like manner as 2° above and below that point of specific gravity are exactly equal. This, however, extends only through a very small range of temperature.”

“In a question of such importance in physics, as the temperature of water at its extreme state of density, it is not wonderful that every contrivance which philosophical ingenuity could suggest for the attainment of accuracy should be resorted to. In all the methods for the determination of the dilatation of liquids, which have been here explained, the previous accurate determination of the dilatation of the vessels, containing the liquids, or immersed in them, must be previously known. A method, however, independent of this, has been suggested and attempted, for ascertaining the temperature of water in its extreme state of condensation. This method rests upon the principle that liquids of different specific gravities, when mixed, will arrange themselves in the order of their weights, the heaviest taking the lowest position. If different portions of water be contained in a vessel, at different densities, the most dense will, therefore, settle itself at the bottom. This principle was applied by Dr. Hope, of Edinburgh, and also by foreign philosophers, in the following manner :

“Tall cylindrical glass jars were filled with water at different temperatures, having thermometers suspended in them at the top and bottom. When the water at 32° was exposed in an atmosphere at 61° , the bottom thermometer rose faster than the top, until the water arrived at the temperature of 38° . After that, the top thermometer rose faster than the bottom. When the water in the jar was at 53° , and was exposed to colder water, surrounding the vessel, the top thermometer was higher than the bottom, until the water in the jar was cooled down to 40° , and then the bottom thermometer was higher than the top. It was hence inferred, that when water was heated towards 40° , it sunk to the bottom, and that above 40° it rose to the top, and *vice versa*. When a freezing mixture was applied to the top of the glass jar, at the temperature of 41° , even though its application was continued for several

days, the lower thermometer never fell below 39° ; but when the freezing mixture was applied at the bottom, the upper thermometer fell to 34° as soon as the lower one. It was hence inferred, that water, when cooled below 39° , cannot sink, but easily ascends. When the water in the jar was at 32° , and warm water was applied to the middle of the vessel, the thermometer at the bottom rose to 39° before the thermometer at the top was affected at all; but when the water in the cylinder was at $39\cdot5^{\circ}$, and cold was applied to the middle of the vessel, the thermometer at the top fell to 33° before the lower thermometer was affected."

"Water, in its state of greatest condensation, has been adopted by the French as the basis of their uniform system of measures. Their unit of weight is called a *gramme*, and it is the weight of a cube of distilled water taken in its state of greatest condensation, the side of the cube being the length of a *centimètre*, or the one-hundredth part of their unit of measure which is called a *mètre*, the length of which is $39\cdot3702$ English inches."

"If the weight of distilled water, at the temperature of its greatest condensation which a vessel contains, be known, the capacity of that vessel will then be easily determined, since a given bulk of distilled water is known. On the other hand, if we determine by measure the actual contents of a vessel, we shall know immediately the number of *grammes* of water in a maximum state of condensation, which that vessel will contain. If the weight of water at any other temperature, which the vessel contains, be ascertained, the weight which it would contain at the temperature of maximum condensation may be easily determined by the aid of the tables for the dilatation of water at different temperatures."—*Lardner's Cabinet Cyclopædia*, Art. *Heat*. vol. 39, pp. 76—79.

ERRATA.

Page. Line.

- 26, 7, from below, *for* "this however," *read* "this being however."
27, 8, before "that the," *insert* "again, can it be doubted."
31, 8, from below, *for* "eight," *read* "eighth."
32, 2, from below, *for* "karikia," *read* "karika."
33, 15, from below, *for* "Bat," *read* "Bath."
35, 14, *for* "Minshen," *read* "Minsheu."
36, 3, *for* "Minshen," *read* "Minsheu."
39, 7, after "ounce," *insert* "or 218·75 grains."
50, 2, *for* "phenomenon," *read* "a phenomena."
18, *for* "inspection," *read* "an inspection."
61, 8, *for* "or it may be revised," *read* "or, it may be, revived."
72, 2, from below, *for* "on the," *read* "and on the."
83, 3, *for* "or square cubits," *read* "or 13609·5556 square cubits."
86, 18, *for* "indebted for," *read* "indebted to the patriarchs for."
20, *for* "from the Jews," *read* "from their descendants the Jews."
88, 1, from below, *for* "the freedom," *read* "that the freedom."

Correspondence,

WHICH HAS LED TO THE TAKING FROM

Mr. K Y D,

THE REPAIRS OF THE

Company's Vessels.



PRINTED BY SCOTT AND CO., INDIA GAZETTE,

No. 2, Jebb's Lane, Cossitollah.

1832.

Correspondence.

Extracts from a LETTER, and Resolution of Government under date 24th August, 1830.

LETTER “ Para. 9th.—The Board will further consider and report, as to the possibility of executing repairs, &c. by annual tender, with a view to a reduction of the rates of charge, at which work of this description is at present executed.”

RESOLUTION “ Para. 26th.—With respect to the Terms on which work is at present executed by the *Master Builder*, which His Lordship in Council understands to be the following—Timber, Iron-work, and other materials used, are charged for at fixed Market rates settled at intervals by the *Marine Board*, workmanship, &c. being added, the *Master Builder's* remuneration is by a Commission of 20 per Cent upon the total, excluding however Copper work, upon which the charge is only 10 per Cent, although the Government should provide its own materials, the *Builder's* charge of Commission thereon is the same, and he has the benefit

*of the Remnants of Timber and other similar perquisites.**

The Finance Committee state these terms, to be the usual terms on which similar work is performed at the Dock Yards of the Port, and bear testimony (a point in which His Lordship in Council fully concurs with them,) that the Government have had ample reason to be satisfied with the character of the work executed by Mr. Kyd, which is universally allowed to be of very superior quality.—A further argument for continuing the Government work with the present *Master Builder*, is the peculiarly convenient situation of the Yard.—But notwithstanding all these circumstances in favor of the existing system, His Lordship in Council is not quite satisfied, that the Government work might not be procured to be executed cheaper, more especially at times, when the several building Establishments have difficulty in procuring work enough to give them constant employment. On these grounds it remains to be determined, whether the Government work in the way of repairs should not be laid open to annual competition in like manner, as what is called the new work, that is, the building of new Vessels, &c. The Tenders would in such case be confined of course to the rates of commission, and of charge for Timber and Iron work, and Government would rely on its professional Surveyor to superintend the workmanship, and approve the materials as at present. A power would of course be required to be reserved of rejecting any tender without assigning reasons, so as to prevent the necessity of closing with

* This is a mistake, he has no perquisites whatever.—The remnants of Timber are used for the work without charge. J. Kyd.

Establishments, inconveniently situated, or in other respects objectionable.—The Governor General in Council wishes this subject to be considered as still open, in the mean-time, repairs will be conducted as at present, at the *Master Builder's Yard*, and on the present terms. *New work only* being put up to competition in the manner now practised. The Committee appear to have been misinformed as to the fact, that the *Master Builder* has any privilege of deferring the submission of his tender, until the others have been received and opened."

To C. B. GREENLAW, Esq.

Secretary to the Marine Board.

SIR,

I have the honor to acknowledge the receipt of your letter of the 11th instant, forwarding Extracts of a letter and Resolution of Government, under date the 24 August last, with the view to my offering any remarks that might be deemed expedient by me, prior to the Board reporting to Government on the subject.

As the terms under which the repairs of Government Vessels, and of private trading Ships, are at present executed at Calcutta, are precisely similar, and as the owners of the latter would gladly adopt any practicable means of lessening their expences in these depressed times, it is to be presumed that no real advantage could be derived from the measure of executing repairs by annual contract, as suggested in the above mentioned Resolution of Government.

It is well known that the Proprietors of Ship Building Establishments, find it difficult under the existing rates

of charge to maintain their ground. As a drowning man would grasp at a straw, some might be found to undertake the work of repairs at reduced rates, but I will venture to affirm, that the ultimate consequences would be in no respect beneficial to Government, while they might have the effect of overthrowing every Ship Building Establishment at the Port.

Parties undertaking to execute repairs at less than remunerating rates, must either submit to present loss, and eventual ruin, or seriously injure the interests of their employers. In the former case, if their resources are slender, they must speedily sink under their losses, if they have a considerable command of funds, they may submit to present loss, calculating that before their resources are exhausted, their rivals will be ruined by being compelled either to give up working altogether, or to work to equal disadvantage, so that being left in full possession of the field, they may make what rates they please. In the latter case they must contrive to get inferior materials, and workmanship approved of, producing the necessity for more frequent, and more extensive future repairs, and thus greatly increasing the eventual expences of their employers. In either case the experience of the last thirty years has abundantly proved, that those who have endeavoured to supplant their rivals, by affecting to execute work under the established rates, have under every degree of support from Capitalists, been invariably ruined, while their constituents, of whom the most respectable remaining are now among my employers, acknowledge that their aggregate charges for repairs, under apparently light rates, were particularly heavy.

During eighteen or twenty years from the date of my commencing business, I had many rivals, of whom only two escaped destruction, having realized perhaps together about £30,000 after a long period of industrious labour, at fair and equitable charges, while the rest, who pretended to work cheaply, successively failed, occasioning a loss of capital of more than 500,000£. Within the last six years other failures have taken place, and more will no doubt follow, while I, after exerting myself industriously for a quarter of a century, executing work for Government, and individuals honestly, and faithfully, at honest rates of charge, am still obliged to continue my labors, although, if the assertions of some were only partially true, I ought to have been long ago able to retire in affluence. My private constituents, many of whom thought otherwise once, from the effects of misrepresentation, give me credit as much for reasonable charges, as for substantial workmanship, and as my exertions and the operations of my Establishment, have been often honored by the especial approbation, both of the Local Government, and of the Court of Directors, I feel assured, that after the strictest investigation of the subject, the Governor General in Council will not be able to discover any positive chance of saving, from the proposed measure of having repairs executed, by contract, which could counterbalance the hazards of such a change.

The Ship owners of Calcutta, who are fully alive to their own interests, and more particularly so in these difficult times, are not accustomed to have single cases of repair executed by contract. Strangers sometimes

do so, and when their work is done, they generally regret having adopted such a course.

When new work is done by contract, the parties for whom it is executed, either regret their engagements, or those who undertake it, complain of having sustained great loss, and abjectly petition for compensation, a circumstance of which the Government may perhaps be aware.

While my observations have strict reference to the merits of the question, and point to the repugnance with which private ship owners view the idea of having their work done by contract, I am compelled also to point out, that although their work, in regard to materials, rates of charge, and sufficiency, is executed exactly as that of the Company, they have a considerable advantage with respect to the entire cost. Their Commanders and Officers, who are the parties most particularly interested in having the Vessels, that they navigate properly and substantially repaired, are their sole Surveyors, entailing no addition of charge to that of the repairs, while the expence of separate Surveyorship to the Company, must greatly exceed any possible saving that could be made on the limited number of Vessels belonging to this Presidency. Previous to 1815, the Officers of the Master attendants Department, the Branch Pilots, and subordinate Officers in charge of the Vessels, the parties most interested in having the Vessels in the best order for service, were the only Surveyors of repairs, and I apprehend it will be found on examination, that any particular establishment of Vessels, prior to that period, cost less in repairs, and lasted longer, than the same number of Vessels have done since.

I have unwillingly noticed this part of the subject, and refrain from enlarging upon it, or adverting to the difficulties of having any rates of charge for materials fixed, for so long a period as twelve months, together with the bearing of those difficulties against the one, as well as the other, of the contracting parties.

I might also call attention to the circumstance not very improbable, of a reckless contractor, confident in his resources, introducing such rates, as would, when he sunk under the burden, leave neither myself, nor any other existing Dock Proprietor, capable of undertaking the work on the present system. Since the question, however, regards the saving of public money, I would not appeal to any motives of pity, although from my length of faithful, and laborious service I might be considered to have established some right to do so. As far as I am personally concerned, I rest my case on simple justice, consistent with enduring economy, on the part of the Honorable Company. In this light I regard the present system, as more favorable to Government in the long run,—than any by which it could be superseded, and I should be unable after having for so many years performed work, on known fixed, and equitable principles, to undertake the task of framing a tender of contract, in making my calculations for which, I must either consent to unavoidable loss, or endeavour by some means or other, to have the prospect of getting greater compensation for my services, than I at present enjoy.

While in deference to the wishes of the Board, I submit to notice the above general remarks, on the merits of the suggested measure, and shall be glad to furnish

any further explanations, that may be required on the subject, I am saved the necessity of adverting to many facts, and arguments bearing on the case, which have been more ably stated, in the various reports of the Board to Government, particularly in the 18th and following paragraphs of their LETTER, under date the 5th July 1826.

I have the honor to be
Sir, &c.

<i>Kidderpore,</i>	}	(Signed) JAMES KYD,
<i>30th of October, 1830.</i>		
		<i>Master Builder.</i>

Extract of a LETTER addressed to the Vice President in Council, in the General Department, dated the 29th November, 1830. by the Marine Board.

With reference to *Mr. Secretary Prinsep's* Letter under date 24th August last, and its Enclosures,* we have the Honor to report our sentiments, as to the manner in which the Repairs of Government Vessels should be executed, and the Establishment which under existing circumstances we consider should be kept up, for the Superintendence and Survey of the Works.

2. We deem it unnecessary to enter into any Detail relative to the Origin of the present System of Repairs, nor need we discuss the Comparative advantages of a public Establishment, and of a Private

* *Mr. Secretary princep's* Letter paras : 8 & 9.

Resolution of Government of 24th August, paras : 22 to 26.

Finance Committees Report, dated 13th August, 1829. paras 47 to 55.

ditto ditto dated 2nd January, 1830. paras. 13 to 18.

Yard for their Execution. We imagine that we are to confine ourselves as regards Repairs, to the question of the best mode of executing them by the Agency of Private *Builders*, and as regards the Surveying Establishment, to that of Reduction in its Expenditure, without impairing its efficiency.

3. With respect to the Repairs, we may premise that prior to 1826, Mr. Kyd was *Master Builder* to Government, with a Salary, and Establishment,* receiving 10 per Cent on his Disbursements. Under this arrangement, he executed all the Naval Works of Government, new, and old, on Estimates previously prepared. On the 5th July of the above year, our *Board* addressed Government, and proposed a change of System, with a view to our being able to introduce the Principle of open Competition, as regards New Work, leaving the old, or Repairs to be executed by Mr. Kyd, on the ordinary terms of the Port; viz. 20 per Cent Commission, on the outlay. Mr. Kyd on this consideration, gave up his Salary, and Establishment, but Government have since granted him the amount of the former; viz. Sa. Rs. 250, as a personal allowance.

4. Such is our opinion, of the skill and professional abilities of Mr. Kyd, as well as of the superior execution of his works, and the convenient situation of his premises, that if we were only quite satisfied of the

* Salary.....Sa. Rs. 250

ESTABLISHMENT.

One European Carpenter	Sa. Rs. 150	
One Writer	60	
One Sircar	60	
Ground and Godown rent	150	420

Total Sa. Rs. 670

equity of the Rates of charge, from time to time, proposed by him, we should not be disposed to recommend any reference to competition, for it will not be easy to apportion the extent, to which we ought to recommend a preference to be given to Mr. Kyd, over other Individuals, tendering by open competition; and we cannot altogether deny, the force of the appeal made by him, in his letter under date 30th October, copy of which is herewith forwarded, to the effect, that Tenders uncommonly low, may be made for the purpose of obtaining the contract, with a view to a future increase in the rates of charge.*

* *Extract of a LETTER from the Marine Board, to Government, dated the 28th February, 1821.*

The usual charge made by *Ship Builders* in this City, for conducting the Repairs of Ships, and Vessels, is, we understand, 20 per Cent. Of this 10 per Cent, is supposed to cover the charges for Establishment, and Workmanship, and 10 per Cent to remain clear profit to the *Builder*.—Our letter of 23d August, 1815, above referred to, shews, that Mr. Mathew Smith, a Ship Wright, was willing to undertake to perform the Company's Business, on being allowed a Commission of 12 per Cent. In acceding to this arrangement, he was swayed, probably, more by the distinction of becoming *Master Builder* to the Company, and the certainty of being retained in their constant employ, than by the fair remuneration for his charges and labour, which such a per Centage would afford him. Messrs. Kyd's, on the other hand, under an impression, it may be supposed, that if they refused to work on terms equally low, as those which another, had agreed to do, and which we were directed by Government to offer them, they would run the risk of losing the Company's Business, did, in the words of their acquiescence, which we quote below, imply some degree of uncertainty, as to the result being favorable to them.

“An anxious wish to meet the views of Government in every respect, is a sufficient inducement for us to endeavour to perform

5. We have however some doubt in respect to the Rates being as moderate, as they ought to be ; and the difficulty of ascertaining the point is much greater, than the Finance Committee seem to apprehend. The articles supplied by Mr. Kyd are of great variety, and many of them are constantly varying in value. When the last change was made, we introduced the present System of fixing the Prices, at which the several articles should be charged, prior to the commencement of each Quarter; and as the first allowed would become the foundation of all future Statements, we endeavoured as much as we possibly could, to obtain fair Rates. The chief differences between Mr. Kyd's Statement, and that of Mr. Seppings' were in the Prices to be charged for wood and iron; both of which were after a lengthened discussion, fixed, as they now stand, on a reference to the Government. With regard to the latter, we still think the Price very high : with respect to the former, we do not feel ourselves so competent to speak, particularly as the Prices were approved by the Commissary General, after a Minute Scrutiny.

6. Such being our views of the present arrangement, and of the extreme difficulty of satisfactorily settling the Rate of Charge, we cannot but think, were it only with a view to settle this point, that the Repairs of

" the Honorable Company's Business, agreeably to the plan submitted to us ; and we therefore beg with the utmost deference and respect, to state, that we shall use every exertion in our power to conduct the Honorable Company's work, as proposed therein, and in the event of its being out of our power to perform it on such terms, without injury to us, we shall deem it our duty to solicit the attention of the *Board*, to such parts of the arrangement as may appear, on trial to be impracticable."

Government Vessels should be put up to open Competition; and this we conceive should be done by fixing the prices, at which every description of Timber and every Article required is to be furnished, and by them calling on parties, tendering to offer, the rate per Cent Commission on these Prices, at which they will undertake to execute the work, for a year.

7. The present Quarterly Statements, may form the ground work of those, to be submitted to Parties likely to contract; such prices, being fixed as on the best enquiries, we may have reason to believe, approach nearest to the fair average Rate.

TO CHARLES B. GREENLAW, ESQ.

Secretary to the Marine Board.

SIR,

With reference to the Advertisement, in the *Exchange Gazette* of this day, inviting tenders for the repairs of the *H. C. Brig Brougham*, I beg respectfully to bring to the notice of the *Board*, and of Government, that I consider the proposed mode of repairing the Government Vessels, is calculated to destroy the privileges vested in me, under my appointment as *Master Builder* to the Hon'ble Company.

My appointment to this Office in conjunction with my late Brother, bears date the 5th June, 1805, at which period a Salary, and Establishment amounting annually to Sicca Rupees 9,840, were attached, and an additional allowance was made of 10 per cent, upon the amount of work, executed for the public service.

An agreement was at a later period, entered into by us, as *Master Builders*, with John Lowe, Esq. (the then Secretary to the *Marine Board*) on the part of Government, and which continued with some modification, until November, 1826, when the Government thought proper to consolidate the Salary, and Establishment into a commission. The prices for the supply of materials, was regulated in advance, by a quarterly Statement of rates, and a daily receipt for materials supplied, and men employed, at these authorized rates, was established.

The above system continues in force, under the authority of Government, and no notice or intimation of any change, having been forwarded to me, from the *Board*, I cannot but regard the Advertisement referred to, as a preliminary step to the gradual abolition of those rights, to which I have been delegated for 26 years,* and I trust to the uniform satisfaction of Government—I therefore respectfully solicit the consideration of the *Board*, to the claims which I prefer, and to request the favor of their representing to Government, the prejudicial consequences which will result to me, by adopting the proposed plan of repairing Government Vessels, and in fact that the adoption of it, will amount to a total annihilation of the appointment I have had the honor to hold, and I hope faithfully discharged, for so long a period.

I have the honor to be,
Sir, &c.

KIDDERPORE, }
5th of August, 1831. }

(Signed) JAMES KYD,
Master Builder.

* Besides having been Assistant to the late *Master Builder* for 4½ years, a servitude in all of nearly 31 years.

Extract of a LETTER from Government, in the General Department, dated 16th August, 1831.

I am directed to acknowledge the receipt of your Letter, dated the 9th Instant, submitting Tenders for repairing the Barque *Brougham*, and a representation from Mr. Kyd, of the injury he will sustain as *Master Builder* to Government, if Business of this kind, is put up to open competition.

2d. The Honourable the Vice President in Council is sensible of Mr. Kyd's claims from long, and meritorious Service, and will be ready to attend to them, on every proper occasion, but when it is made evident, that his charges are excessive, His Honor in Council cannot sacrifice the interests of Government, by giving him the preference, to which he would be otherwise entitled.

FORT WILLIAM,	}	(True extract)
<i>Marine Board Office,</i>		(Signed) C. B. GREENLAW,
<i>The 19th August, 1831.</i>		<i>Secretary.</i>

TO CHARLES B. GREENLAW, ESQ.

Secretary to the Marine Board.

SIR,

I have the honor to acknowledge the receipt of your Letter of the 19th Instant, forwarding for my information extract of a Letter dated the 16th Instant, from the officiating Secretary to Government, in the General Department, and beg respectfully to request, that the *Board* will be pleased to submit to the consideration of the Honourable, The Vice President in Council, the following remarks, or their substance, together with such observations in their support, as they may consider the case to deserve.

2. Under the extract of a Letter, and Resolution of Government of the 24th of August, 1830, which you communicated to me, on the 11th of October last, repairs by open tender would appear to be contemplated by His Lordship in Council, at some future period, but in such Letter, it is also signified that, “in the mean time repairs, will be conducted as at present, at the *Master Builder’s Yard*, and on the present terms.”—I therefore felt perfectly assured, that pending the report, which Government were pleased to require upon the occasion, no deviation would have been made, from the present system, without further intimation to me.

3. Grateful for the acknowledgement of my claims for long and meritorious Service, and the assurance that ‘The Honorable, ‘The Vice President in Council, will be ready to attend to them, on every proper occasion, it is with great reluctance, that I venture to obtrude, the case of so humble an Individual, on the valuable time claimed by the great, and important duties of Government; and it is therefore with the utmost deference, that I entreat the indulgence of a few remarks, in explanation, and defence of my charges, which His Honor in Council has been pleased to regard as excessive, and which has led to the taking from me the preference, to which I would be otherwise entitled.

4. The rates of all Articles in my department whether supplied by myself, or furnished to me, from the public Depôts, are settled Quarterly in advance, and sanctioned by the *Marine Board*, after examination, and inquiry under the signature of the Surveyor; and I am bound under their orders to frame Estimates, by those rates.—many of them the Company’s from their own depôts. The work being also performed, under the immediate

direction of the Surveyor, nothing unnecessary can be executed, so as to enhance thereby, the aggregate charge for any job whatever.

5. Under this simple explanation, I humbly submit that I cannot with propriety be accused of making excessive charges, or that the charges so made, can even be called mine, for the sanction of them by the Government authorities, makes them by adoption, theirs.

The *Board* having thus identified themselves, with the validity of the charges, which are now made for Government work, and having at all times rigidly enforced the utmost economy, in every branch of expenditure, arising out of my department, will I trust induce the Honorable, The Vice President in Council to confirm the resolution of Government, continuing the repairs to me, until the change alluded to, in your Letter, of the 11th of October last, shall take place. I perceive that Tenders for the repairs of Government Vessels are invited, for the 26th proximo, but I still trust, that the claims I have to the support of Government, will after the strictest inquiry, eventually confirm to me, the repairs of the Government Vessels.

I have, &c.

(Signed) J. KYD,

25th of August, 1831.

Master Builder.

TO GOVERNMENT,

General Department.

HONORABLE SIR,

Having communicated to Mr. Kyd, the sentiments of Government, conveyed in the 2d paragraph of Mr. Officiating Secretary Bushby's Letter, under date 16th

ultimo, we have received a Letter from him, dated 25th, Copy of which agreeably to his request, we beg to submit, for the consideration, and orders of your Honorable Board.

2. Government have so frequently recognized Mr. Kyd's claims to consideration, grounded on the long period, during which he has been connected with the Service of the Honorable Company, and on the zealous and able manner, in which he has conducted the duties resulting from that connection, whether as *Master Builder*, Assistant to the Master Attendant, or under the arrangements sanctioned on the 21st September, 1826, and we have so constantly borne testimony to his merits, that it would be superfluous now further to advert to them.

3. In the 5th Para. of our Letter, No. 555, dated 24th June, we explained what we considered the situation of Mr. Kyd to be, in regard to the Repairs of the public Vessels, until the general question should be settled; and in our Letter, No. 109, dated 16th July, forwarding Estimates, for the Repair of the *Brougham*, we adverted to that Paragraph. Government, however having still directed, that the Repair of the *Brougham* and subsequently of the *Diana* should be put up to open competition, and thus determined the Question as it regards Mr. Kyd's claims to execute the Repairs, until the Final Arrangements adverted to, shall have been made, we are precluded from recommending any deviation from that determination.

4. In justice however to Mr. Kyd, and with reference to the Remark in the 2d Para. of Mr. Bushby's Letter of the 16th Ultimo, to the effect that it has been

made evident, that his Charges are excessive, we feel bound to state, that however we are, as we have before stated, satisfied that Mr. Kyd's general Charges are too high, yet they cannot be considered to be so in the Ratio, between, his Estimates for the *Brougham*, and *Diana*, and those lately sent in by Messrs. Montgomery and Co.

5. Government cannot but be sensible, that in preparing his Statements of proposed Charges for a given period, Mr. Kyd has to take into consideration the probable variation in Prices, the circumstance of his being obliged to maintain a certain fixed Establishment, and to keep in Store a certain quantity of all kind of Articles, to meet the repeated contingent demands on him for Repairs, demands which sometimes do not admit of delay. The same considerations would of course come into Operation with Messrs. Montgomery and Co. if they had to tender for the general Repairs, but circumstanced as Messrs. Montgomery and Co. are known to be, they have no such fixed Establishment, or Stores on hand. In tendering for an occasional job they have only to consider the immediate existing state of the Market, as to the Prices of the Articles, which, by the Specification, they know will be required. They will not purchase a single Article beyond what is required, and they have only to pay for the Workmen hired for the Specific Work.

6. It is obvious that these circumstances, independently of the fact, that Individuals in distress are always willing to work at less profit than fixed Establishments, must tend materially to lower the Estimate of Messrs. Montgomery and Co. below those framed for

the general charges of Mr. Kyd, even if these latter were on a level, with the customary charges of the other established Ship Builders of the Port. How far they are so, is, we conceive, the Question now at issue, and this will be determined on the Receipt of the tenders which are advertised for, on the 26th Instant. We have before said, that we think Mr. Kyd's Charges are high, but we are bound to say, that in the Bills from other Builders for Repairs of Government Vessels, and for Public Vessels, whose Charges Government have from various Causes borne, we have found little difference, and indeed Government lately had before them a Bill from the Howrah Dock Company, for the Repairs of the *City of Edinburgh*, which being checked by Mr. Seppings, according to Mr. Kyd's Rates, gave the Sum of Sicca Rupees 151 11 7, in favour of Mr. Kyd.

7. Our sole object in making these Remarks, is to show that the Rates tendered for an occasional heavy Repair, are not a Criterion by which those for the General Repairs of Government Vessels, the greater part of which are of a lighter character, can be judged; we do think however, that the great difference exhibited between the two, renders it a question, how far it may not be prudent in the future arrangements, to provide for putting heavy Repairs up to open competition, notwithstanding any contract for the General Repairs; in other words, that Government should reserve to itself the right, whenever it might be deemed proper, to advertise for Tenders for any specific large Repairs.

We have &c.

Marine Board, (Signed)

G. CHESTER,

The 5th September, 1831.

H. SARGENT.

To G. CHESTER, Esq.

And Members of the Marine Board.

GENTLEMEN,

I am directed to acknowledge the receipt of your Letter dated the 5th Instant, with its Enclosure from Mr. Kyd the Hon'ble Company's *Master Builder*, and in reply to observe, that the remark in the 2d Paragraph of my LETTER dated the 16th ultimo, did not refer to Mr. Kyd's charges generally, of which there was no particular information before the Government at that time, but to the instances in which his Estimates had been declared to be excessive, by the Surveyor, and in which in confirmation of that Opinion, lower tenders were afterwards received, which it became incumbent on the Government to accept.

2. The Vice President in Council is sensible, that the circumstances adverted to by the Board, may account for Mr. Kyd's charges, but the question really for consideration is, how the work can be most cheaply, and at the same time efficiently performed.

3. The Board appear to have advertized for Tenders for annual Repairs, according to their former suggestion which was approved by the Right Hon'ble the Governor General.—The Vice President in Council will be happy to find, that Mr. Kyd's tender may entitle him to the continuance of the general repairs in his hands, but concurs with the Board in Opinion, that the Government must

reserve to itself the right to advertize for Tenders, for any specific large repairs, whenever it may be deemed proper.

I have &c.

(Sd.) G. A. BUSHBY,
Off. Secy. to Govt.

COUNCIL CHAMBER, }
The 20th Sept. 1831. }

FORT WILLIAM, } (True Copy)
Marine Board Office, } (Sd.) C. B. GREENLAW,
The 30th Sept. 1831. } *Secretary.*

To His Honor

SIR CHARLES METCALFE, Bt.

Vice President in Council, &c. &c. &c.

HONOURABLE SIR,

1. With reference to the correspondence, which has lately passed between the Government and me, through the *Marine Board*, on the subject of the Invitation of annual Tenders, by the Marine Board, for the repairs of Government Vessels, I beg respectfully to lay before your Honor, the following observations, hoping that they will afford a satisfactory exposition of the justice of my claims, and induce your intercession to annul a measure, which if carried into effect, cannot fail to consign me to ruin, and destitution.

2. I conceive the measure in question of repairing the Government Vessels by annual contract, may have been induced, under a supposition that my emoluments were excessive, and that a material saving to Govern-

ment would result, from the repairs of Government Vessels, being laid open to public competition. For the sake of elucidation, I have annexed a brief Statement of the several Systems, which have been adopted by the Government authorities, from time to time, in my department, shewing that the most rigorous scrutiny (as I am anxious it should be) has been exercised by the proper authorities, to prevent any undue advantage arising to me, otherwise than an equitable remuneration for myself, and my establishment, in conducting the Government works.—It will suffice I trust for the present to state, that the whole emoluments I have received for myself, European, and native assistants, premises, &c. have been under 2,000 Rupees per month, the moderation of which cannot be questioned*

3. I beg to be allowed to inform your Honor, that I served the Company nearly 5 years as assistant, and have held the Office of Builder, confirmed by the Honorable Court of Directors, upwards of 26 years, that in the course of that time, upwards of 50½ lacks of Rupees of Public money have passed thro' my hands; that no deduction, even to the fraction of a Pie, has ever been made from my Bills, amounting in number to 6437, that not a single instance of neglect, nor of bad

* *Marine Board to Government, 5th July, 1826.*

We beg to transmit a sketch, the correctness of which may be depended upon, of the advantages derived to the *Master Builder*, both by his commission, of 10 per cent, and by his salary, for the last 20 years, from the Public works entrusted to him, which appear to us to be extremely small, and to be scarcely more than equivalent to the simple Benefit, that has resulted from our having him as a Public Officer to consult with, on different points of a professional nature. It will be seen that the average annual Receipts of the *Master Builder*, on account of Commission, and Salary for the last twenty years, amount to Sicca Rupees 22,400 3 2, or 1,866 10 11, per mensem.

work has occurred, nor have I ever been visited with one word of censure, from a Government authority, but on the contrary, I have been honored with several testimonials of Government, expressive of their high approbation; and with these recommendations in my favor for zeal, and integrity, I conjure your Honor not to permit me to be stripped of those advantages, which I have been taught to regard as permanent, and as a prescriptive right, grounded upon long, and faithful services to the Government. It will suggest itself to your Honor, that the mere circumstances of tenders being given at a lower rate, than affords a legitimate profit upon the work, may either be the act of a confederacy, or in the spirit of rivalry, by some more opulent Builders, whose circumstances, and situation place them for a while, beyond the reach of harm. Your knowledge of mankind, has no doubt furnished you, with many instances of Persons tendering to execute a certain work, at prices notoriously lower than a saving rate, and altho' as an habitual practice, it cannot fail to be attended with ultimate ruin to the contractor, yet as a temporary expedient, it is some times resorted to, with a secret view to acquire subsequent advantages, which may serve to atone for the sacrifice.

4. Various changes have been made for these sixteen years past, in the mode of regulating, and adjusting my charges, consistently with the public Interests, and I entreat your Honor to direct such further inquiry and if needful, institute such other System of supervision, as will effectually place my charges beyond suspicion, and convince you, that they are no higher than the lowest, remunerating rate—Individuals not experienced in the nature of the work they undertake,

but probably being actuated by a desire to undermine me, and effect a monopoly in their own favor, will I am sure appear to your sound judgement, as no criterion for a fair and proper standard of charge. It has been the invariable practice upon any occasion, when the prices of articles have been questioned, to compare them with those of other Builders of the Port, to their customers, and for further information, reference has been made to Government Establishments, under all which enquiries, my charges have been found moderate; nor have the Finance Committee after a vigilant examination, arrived at a contrary conclusion.*

5. I beg to state, that my Father embarked his Property in my present Establishment, for the benefit of my late Brother, and self, in the firm persuasion that the situation of Builder to the Company, with its emoluments would be permanent—That the saving to the Government by the measure has been great, a comparison of an equal quantity of work executed and services rendered in my line, if done by the Builders of the Port, would be triumphant in my favor; as would a comparison with other Government Departments of less importance, had my dock yard, or one exclusively for their own works, been carried on, at the expense of Government.

6. I beg likewise to state, that in addition to long and faithful services, I have been fortunate, on two special occasions, in being of more than ordinary ser-

* "The professional abilities of the present *Master Builder*, and the very superior manner in which his work is executed, is acknowledged by every one.—We have not found it proved, that his charges are higher than those of other Builders; under all the circumstances of the case, we think it will be best for Government, to continue to avail themselves of his services."

Finance Committee's Report.

vice to my Honorable Masters.—The first was in my plan and execution of the Calcutta Moorings, which have yielded since they were laid many lacks of rupees, and still yield a large annual revenue*.—And the other was in the repair of the *Semiramis* Frigate, at St. Helena, whereby the Company's Fleet of 32 Ships, 19 of them Tea loaded, were enabled to sail without waiting for further convoy, thus saving a very large sum in demurrage to the Company, as well as a fine Frigate to the King.†

7. I beg moreover to state, that altho' my Establishment has always been in extent, more than equal to

"* We the undersigned having met, and inspected a plan proposed by Mr. Kyd, for laying chain Moorings off the Town of Calcutta, are of opinion, that the plan proposed by him, is far preferable to the one which we before approved of for the Moorings.

Mr. Kyd's present plan for laying the Moorings, being more secure for Ships, less difficult to be laid, easier to be weighed if required, and less expensive."

CALCUTTA. }
18th October, 1806. }

(Sd.) C. THORNHILL.
" I. SHORE.
" H. CHURCHILL.
" M. SMITH.
" E. BARTLET, *Pilot*.
" JOS. WELDON, *Ditto*.
" I. WADE, *Ditto*.

Extract of the Public Letter to Bengal, 30th June, 1815.

" And recommend Mr. Kyd to your favourable notice, entertaining as we do a high sense of his merits, particularly on the occasion to which we have alluded, when the zeal and ability displayed by him in forwarding the sailing of our ships, were so conducive to our Interests, and so honorable to his own character."

† I have it in command from my Lords to express to you their thanks for your conduct upon the occasion above mentioned: and at the same time I am to request, that you will accept of a piece of Plate of the value of one hundred Guineas, from my Lords, on which will be inscribed a suitable testimony, of their Lordships approbation of your conduct, on the instance in question.

(Signed)

J. W. CROKER.

2d March, 1815.

execute the Company's Work, in ordinary times, not only have the Government had the exclusive benefit of it in time of War, but I have invariably even in ordinary times, when the sacrifice has been great, declined Private Work, however lucrative, whenever it interfered the least with that of the Company, and which has had the effect of breaking connections for Private Work as well as of depriving me of considerable profit, which I should otherwise have had.—I may here for the sake of explanation state, that I should never have sought for any work beyond that of the Company, had it been sufficient to support a Dock Yard, but the small extent of it precluding that I was necessarily compelled to look elsewhere to pay my expences. *

8. The use of the above to the service of Government in the unprofitable employment to me of fitting Transports, during War, the only periods when the business of a Ship Builder becomes profitable, will I trust entitle me to the equitable consideration of Government, in time of Peace.

9 Whether I have a legitimate claim or not, I submit with deference that I have a prescriptive claim from long and faithful personal services to the consideration of Government, as well as a moral, and an equitable

* The Premises are the Property of Mr. Kyd, but we feel sure that they could not be rented at a less rate than Sa. Rs. 1,500 per mensem, and the Establishment, European, and native must be proportionately large.—It is true that these Premises, and this Establishment, are also occupied with Private works, but they are specially devoted to those of the Government, and considered to be always at their command, and indeed through the Public spirit of Mr. Kyd, they are to all intents and purposes as available to the Public service on all occasions, as if they were the actual property of the Company. Small however has been the remuneration of the *Master Builder*."

MARINE BOARD TO GOVERNMENT, }
5th July, 1826. }

claim on the score of a large Establishment given to them in times of War without adequate return, otherwise than a continuance of their Patronage in Peace. Had I originally sought for the Patronage of the Public, and had possessed the same claims upon it, as I have upon the Government, I could according to Established Custom, have sold the good Will of my business.

10. I submit with deference, that I have established my claim for a preference to the Government work and that the just measure of the remuneration, that ought in justice to be made to me, is that of a fair profit, and not what any person would undertake to do the work for.—It is evident, that Persons tendering to execute the Government repair, will be comprised of.

11. 1st. Those, who ignorant of the style of the work requisite for the Government Vessels, will calculate by the inferior mode, to which they have been accustomed to repair Vessels, at a cheap rate, and will find themselves mistaken when too late*.

12. 2dly. Those, who have no character to lose and none to support, are starving, and will be glad to get half a loaf rather than no bread, and who will run every risk to obtain employment, and ultimately Petition Government to take compassion on them.

3rdly. Those, whose length of Purse will calculate on losing for a while, in order to drive out all competitors, and eventually to obtain a monopoly, when they can charge what they please, to remunerate them for their first losses.

*In 1805.—The *Navy Board* desirous of extending their Tenders for New small Ships of War to the out ports, 21 *Ship Builders* were bankrupted by the measure.

13. If there were any visible inconvenience attendant on, or if any improvement could be applied to the present System of charge, or if any inference could be drawn of excessive benefits from my present circumstances, which so far from being affluent, are in a notoriously impoverished state, I am not in any way opposed to meet every wished for inquiry, as well as check, but where it appears after the closest research, by a special Committee, that my prices are perfectly just, and when the *Marine Board*, whose province it is to control them, within the narrowest limit, declare in their opinion, that the remuneration afforded me is rather too small, than above the proper standard of charge, I feel warranted in deprecating as chimerical, any attempt that would disturb the opinion recorded by the *Board*, after years of deliberate, and mature consideration—should the System progressively brought to its present state, be displaced by another, which has no rational basis for its adoption, the fate of its existence may safely be predicted—nevertheless the consequences to me would in all probability be the same, as the expected relief might come, when the mischief had been endured, and the evil beyond cure.

14. In the quality of the work executed by me for Government, they have a sure guarantee of its goodness, because the character I have established at this stage of my life, is too precious not to preserve unimpaired, whilst the ephemeral or annual contractor, gets rid of his responsibility the moment he is paid; and altho' the surveyor ought not to escape from censure by any defaults of the contractor, yet the changes of fixing him with blame, upon points of a professional nature, are extremely difficult to establish. Messrs. Cruttenden

Mackillop and Co.'s Howrah Dock Company's Dock Yard continues to be the chosen resort for Government Contract work, arising no doubt from the patronage and assistance of the surveyor, who until lately, prohibited by an order from The Hon'ble the Court of Directors, was receiving a monthly salary from the Proprietors, as well as benefits arising from the survey of private Ships. The surveyor is therefore obviously interested in favoring the Parties from whom he has derived an essential benefit, and this motive forces the inference that his object is not to amend systems, but to get rid of those in use for the obvious purpose of throwing the Government Work into the hands of his friends. By these means he would raise himself above the trust confided to him by his Office ; he would become the sole executive comptroller of the Government Work ; he would employ his newly fledged powers to gain the Establishment he favours to his own purposes, and would under promise of freight, or otherwise, to Commanders of Ships, be enabled from his official situation, to prescribe to them the choice of the Dock they shall employ. So long as this state of things subsist, and so long as the surveyor is deputed to the double capacity (as by the system of annual contracts he would virtually be) of Builder, and Surveyor, there is no protection against the wasteful expenditure of Public money, and no security for his fidelity, either in one relation, or the other ; but this is not the worst feature of the case—The public Business will become impeded and embarrassed by inexperience in conducting the Public Service, the Accounts will require to be new modelled, the surveyor will in time grow exorbitant in the use of his power, and upon every occasion of emer-

gency, nothing but confusion and irregularity will prevail,

15. That I am warranted in stating this, I beg to refer to the records of the Board, from which it will be seen that in every case where exertion was required, I have been compelled to do the work unshackled by the Surveyor—During the Burmese War, the work was commenced, under the supervision of the Surveyor, but which clogged my exertions so much, that I very speedily convinced the Embarkation Committee, that the object of the Government, would be frustrated, and the entire operations of fitting Ships, and Boats, for service, would fail, if persisted in, and I was left free to follow my own measures.

16. Even the having no one person to refer to for a series of years for the particulars of the work done, trivial as it may appear at first sight, will be a serious inconvenience to Government, if I may judge by the frequent references to me, many of them so important, that I without fear of contradiction state, that but for the information obtained from me, many of the accounts of the War expenditure, could not have been settled.

17. I am well aware that the Surveyor has left no stone unturned to bring about this measure, as he would thereby be erected into an uncontrolled dispenser of the work, to whom he pleased, from the facility with which he could favor intending competitors, in the execution of repairs, and which I submit is the strongest possible ground for continuing the work to me, under regulated prices; for with me the check of the Surveyor may be efficient, but with a favoured Party it is obvious, that his uncontrolled proceedings

may lead to the loss of thousands of the **Public money**, without remedy. So long as the work is continued to me, the wholesome principle of two **Persons** in opposition will be preserved, but the benefit of which will be lost, the moment the Surveyor goes uncontrolled to another, for he not feeling himself independent of the Surveyor, as I do from the appointment I hold, will the more readily seek his favor, as indispensable to his own **Interest**, and success—The short period of a year, that the contractor would be certain only of the work, must impress him with the strongest feeling of his dependence on the Surveyor.

18. In England where the new Ships of War only are built by contract, the resident Surveyor is kept to his duty, by occasional deputations of surveying Officers of higher rank from the **King's Dock Yards**; by a final survey of the Ship by the Officers of the **Dock Yard** where she is delivered, and by the prospects in life of the Surveyor whose rise in the **King's Dock Yards** is made dependent upon his conduct, when sent to an out port to supervise the Building of a Ship. No such, nor indeed any check can be placed over him here, and it is most obvious, that the appointment of a Surveyor, in the **Marine Department**, upon a mature view of the case, must be supplementary to my appointment. The **Government Builder** may exist, and has existed without a Surveyor, but the latter uncontrolled, as I have shewn, cannot upon **Public grounds** be calculated upon, as of undoubted utility.

19. Having said thus much on general Principles, I will now take the liberty to make some observations upon the **Public character** of the Surveyor. The re-

cords of the Master Attendants Office, and the Marine Board will shew, that a more inconsiderate controller of a Professional branch of Public expenditure never existed, than the present Surveyor ; numberless are the instances in which the late Master Attendant, as well as myself, have interfered, to prevent his doing the most absurd, and unnecessary works, and many have been the absurd and unnecessary works, which he has had done at the cost of the Company, when our interposition to prevent it, was unavailable.—The improvements of his Father of shelf-pieces, thick waterways, and other modes of Carpentry, totally unsuited to this country, especially so to the small class of Vessels under repair, and introduced by him at home, as an artificial substitute for want of suitable materials in England, during War, have formed the chief object of his solicitude. The public Letters, that were written to the Marine Board, and to Government by the late Master Attendant, Commodore Sir John Hayes, were from the length of the unflinching censure they went to, regarding the Surveyor, thought considering the worthy Commodore's warm temperament, to be extravagant, but they were substantially true, and can bear the test of the strictest scrutiny.

20. There is yet one point I have not touched upon in its proper place, and which I am fain to do in this place in the manner of a Postscript, which is, that of the badness of the business of a Ship Builder, in the Port of Calcutta—During my sojourn of nearly 31 years, there have been 18 Ship Building Firms, of which eleven have been ruined, four have withdrawn, and two have made moderate fortunes—a most instructive fact confirmatory of my statement.—Of the eleven who

were ruined a million sterling, at least has been lost by them—as complete a refutation to the assertions of the Surveyor, as to high prices, and proof of the ruin entailed by competition, as could possibly be advanced.

21. In conclusion, I beg to submit that the system upon which I have hitherto performed the Government work, is to all intents and purposes a contract, as far as a contract can possibly be applied to repairs, viz. that of the prices being settled, under the sanction of the Government authorities before hand, and the charge being made according to the actual expenditure, and checked by receipts given—I beg with deference to submit, that the invitation of Tenders as to the lowest rate that others would do the work for, is not a fair rule to be applied to me—and I solicit that the Government will be pleased to direct the Marine Board, or a special Committee, to settle the system in which by virtue of the appointment I hold, I venture to claim, to execute the Government work, in such manner as to put prices beyond suspicion, and to restore to me the privileges, upon which my bread depends*.

I have the honor to be,

Honorable Sir,

Your most obedient humble Servant,

J. KYD,

Master Builder.

CALCUTTA, }
19th of October, 1831. }

**Extract from the Reports of the Naval Commissioners for the year, 1805, Page 49.*

Our attention has been directed to the circumstance of the Navy Board's granting Mr. Walter Taylor considerable advances, notwithstanding he had entered into a contract to supply his Majesty's Yards, with Block-maker's Wares for seven, fourteen, or twenty

As an appendix I humbly submit, that if I am deprived of the Patronage of the Government, whereby I shall be ruined, that they cannot procure another Person in Calcutta, who has been regularly brought up to the business of a Ship Builder.—I beg to annex *extracts* from the evidence, taken before the select Committee of the House of Commons, in 1814, shewing how necessary it is in the opinion of the Authorities in England, that the Person entrusted with the building and repairs of ships, should be so bred. A Surveyor of Shipping also, to be efficient for the service he is to be deputed to perform, should be brought up in the same manner, which I beg to state the present Surveyor has not been, and therefore cannot be of the service contemplated by Government, and must necessarily lead to loss in the line in which it is proposed to employ him.

one years, at specific prices, being inclined to believe, if there had ever been so great a fall in the prices of materials and labour, Mr. Taylor would have insisted on receiving the prices he had contracted for : on giving the subject our best consideration, we are not disposed to condemn, in all cases, the giving relief to individuals in their engagements with Government, as we are of opinion the public concerns should be conducted on broad and liberal principles, conceiving a contrary practice might endanger the supplies in time of war, and be productive of evil ; yet, as it would open the door to great abuses, if too much encouragement was given to complaints, on any small or temporary loss, we would recommend, that whenever it may be thought right by any of the Naval Departments, to increase a contractor's prices, instead of advertising for a new contract, that the information which may justify the proposed increase be laid before the Lord's Commissioners of the Admiralty, for their consideration and determination.

(Signed.) CHARLES MORICE POLE,
 „ EWEN LAW,
 „ JOHN FORD,
 „ HENRY NICHOLLS.

MINUTES OF THE EVIDENCE ; *Taken before the select Committee, of the House of Commons, 1814.*

MR. JOHN HILLMAN.

Are you *Surveyor* of the East India Company's Shipping?—*Yes.*
To what business were you bred? *Ship-wright.*

Did you practice that business any time?—*I did.*

Is it incident to the employment of those persons, alluding to Ship-wrights that a great number of apprentices are brought up under them?—*Yes it is.*

Are they brought up regularly as Ship-wrights, or taken from other trades, and used occasionally?—*Brought up as regular Ship-wrights with seven years service.*

Is it necessary that a regular apprenticeship, should be served to the business, or can you make a Ship-wright of any person who can use tools?—*It is ; there are few we can make Ship-wrights of in seven years.*

Are those men and boys Ship-wrights frequently taken into employment in the King's Yards?—*They are in the time of war ; we bring them up in the Merchant's Yards, and they go into the King's Yards.*

Do any go into King's Yards but those who have been regularly brought up?—*No ; they will not admit any one into the King's Yards without producing their regular indenture for seven years, shewing that they have been apprentices for seven years, and a certificate of service under the indenture.*

Is there an Officer employed by Government to superintend the building of every Ship?—*There is one sent directly the contract is made, the draft is sent to the builder from the Navy Board, and there is a man sent to see the Ship laid down, and he attends throughout the building of the Ship.*

Is it usual for the Carpenter, who is to sail in the Ship, to superintend the building of her?—*They generally appoint the Carpenter very early in a Man of War, which Carpenter is to sail in the Ship.*

To risk his own life upon the workmanship which he superintends?—*Yes.*

After a Ship has been launched in the Merchant's Yards, after this inspection, is she Surveyed again before she proceeds further ?—*She is, before the builder can get his certificate for his final payments.*

MR. JAMES HUGHES.

Were you originally bred a Ship-wright ?—*Yes I was.*

In what yard were you brought up a Ship-wright ?—*His Majesty's Yard at Deptford.*

How long did you remain in the Yard at Deptford ; up to what age ?—*To one and twenty.*

I take for granted the Credit of a Superintendent of a Man of War in the Merchant Yards, is affected in a degree by the examination, when she is to pass for a certificate ?—*certainly.*

You necessarily therefore watch her very much, in order that the ultimate examination may prove a credit to your superintendence.—*Certainly ; for if I, as an Officer, pass such and such works, to that Ship, there are two Surveyors, which come over me, twice or thrice a week ; and that is not all, for after that, when the Ship is launched, she has then to go to a King's Yard and there to be docked and surveyed, and examined in the minutest point that can be, before they will grant a certificate ; therefore an overseer, or a surveyor has not done with the Ship when she is received into His Majesty's Service, as a good Ship, for if any defect or fault shall occur in the repair of that Ship in future, my bread is at stake ; I am liable to be dismissed if that work is executed in an improper manner, I am called to an account, and dismissed from my services*

I wish to ask you whether, in the construction of a Ship, you are obliged, from the nature of the work, to select and employ only people that have served sufficiently long to become skillful ?—*Yes.*

Is the length of servitude of a Shipwright such, as to give a man only a title to be put on such work ?—*Not a day too much.*

Is the period of seven years too much to give a man more than a competent skill to be employed ?—*No by no means ; a builder would not employ a bad man, for fear of having his materials spoiled.*

What proportion of the men employed upon a Ship must have the skill that is acquired by the ordinary length of servitude?—*Every one, or he will not be employed as a mechanic.*

MR. CHARLES CARTER.

You are, I understand, an overseer employed by the owners of East India and other Ships, to Superintend the building and repairing of those Ships?—*Yes.*

How long have you been employed so?—*Since the year 1780 ; about four and thirty years ; I have been in the East India Service, as Carpenter to the East India Ships, and overseer to the East India Company's Ships.*

To what business were you bred?—*A Ship-wright, and served a regular apprenticeship to it?—Yes ; and my father before me, and was brought up under my father.*

Are the persons employed as Ship-wrights, all regular-bred Ship-wrights?—*They are all, either in London or the out ports.*

MR. WILLIAM FEARNELL.

I understand you are Surveyor of Shipping, to the Transport Board?—*Yes.*

Were you bred to the business of a Ship-wright?—*I was.*

And served a regular apprenticeship?—*Yes.*

Did you practice it for many years?—*Yes for several years.*

J. P. LARKINS.

Has there been a great increase in the price of Ship-wrights labour?—*Very great.*

Do you know that of your own Knowledge?—*It is impossible to check the charge of the Ship Builder for Ship-wrights labour.*

Will you explain what you mean by checking Ship-wrights labour?—*The fact is, when you put a Ship into a builders hands, a respectable man, you put her into his Yard, and you have every confidence in him, and he goes on with the repairs ; you have a Surveyor to see that the work is well done ; but you have no check whatever, as to the number of men employed, or time at all.*

Do you mean to say it is impossible to check a Shipwrights bill?—*Completely so.*

You therefore must entirely rely on the person who contracts ?
—*On the honor and integrity of the person who contracts.*

I believe the Vessel that you stated you repaired, in which you had the sum for work put in a lump, was repaired in Mr. Barnard's Yard ?—*Yes it was.*

What Vessel was it ?—*The Walmer Castle.*

How long ago was that ?—*Near four years ago.*

Have you employed Mr. Barnard since ?—*Yes ; and hope I shall as long as I live.*

Then am I to understand, that you did not state, that that charge had been made to you, with the least view to throw an imputation on the builder you employed ? *On the contrary ; Mr. Barnard's bill and charges were the lowest of all the Ships of that year, that were fitted.*

Then we are not to understand, that there is any impossibility of checking the general charge of work, if you suspected an improper charge, and wished to do it, but that you have no motive or interest to do it, when you are employing a respectable person ?—*Certainly not.*

And that general charge has not induced you to withdraw your employment from Mr. Barnard ?—*Certainly not ; I was satisfied with the general amount of the bill.*

J. SPARROW,

You are, I believe, clerk to Messrs. Barnard and Company, Ship builders at Deptford ?—*Yes.*

Do you know whether Messrs. Barnard and Roberts, were regularly brought up to the business of Ship-wrights ?—*Yes ; both of them.*

Do they reside on the premises, and Superintend their own concerns ?—*Yes they do.*

Are the persons employed about you, regularly bred to the very businesses that they exercise ?—*Yes.*

That is to say, are the Ship-wrights regularly apprenticed and brought up as Ship-wrights ?—*Yes.*

(TRUE COPY.)

ABSTRACT.
[REFERED TO PAGE 22.]

1st. SYSTEM, 5th *June*, 1805.

Government appoint J. & R. Kyds, to the Office of *Master Builders*, and Assistants to the Master Attendant.

Salary as <i>Master Builder</i>	250
Surveyor and Assistant to Master Attendant	150

ESTABLISHMENT.

European Carpenter	150
Writers	60
Sircars	60
Ground and Godown Rent	150—820

To which a Commission of 10 per Cent, upon the amount of the work, will be allowed.

Tools.—will be allowed.

50 Rupees per day will be allowed for Dock-hire.

All Articles in the Hon'ble Company's Stores, to be drawn, that are suitable for the work.

Iron to be drawn from Store, and to be allowed 11 per Md. for working it up, besides Coals.

Brass work to be supplied Complete at 70 per Md.

Lead work Do. . . at 20 per Md.

All other Articles are to be supplied by the *Master Builder*, at their cost Price.—

2d SYSTEM, — *May* 1816.

A Surveyor was appointed.

The *Master Builder* was allowed—2 per Cent in lieu of Salary, Establishment, and Tools, making the total remuneration 12 per Cent, upon the amount of the work.

More details were gone into, regarding charge for Dock, Shores, Stages, &c. but all of a minor nature.

Iron work same as before.

Lead work 5 per Md. for working, lead to be drawn from Store,
Brass work to be supplied Complete at 77 per Md.

The mate of the Vessels was in this system, required to sign the receipts for materials expended, and workmen employed.—Every Article, Timber excepted, to be supplied to the *Master Builder* from the Hon'ble Company's Store.

N. B. When not in Store, to be purchased by the Naval Store Keeper.

3d SYSTEM, — May 1821.

Nearly the same as last, with more details.

Iron was enhanced, 2-8 per Md. for working	} The materials to be drawn from Store.
Lead was allowed 6 Ditto.	
Brass Ditto 21 Ditto.	

Every Article to be supplied to the *Master Builder*, except Timber, as in the last System. With some trifling exceptions, still 12 per Cent Commission.

More details.

A 2d. Surveyor is appointed, the receipts for disbursements, were to be signed by the latter.

Tools were again allowed.

Supplies of Articles nearly as the last system.

4th SYSTEM, 14th May, 1822.

Part of the former Salary and Establishment given back ; viz 670 Rupees per month. That of 150 Rupees ditto for Assistant to the Master Attendant withheld.

10 per Cent Commission again reverted to.

Tools were withheld.

Supplies of Articles as before.

5th SYSTEM, — November, 1826.

Salary, Establishment and Commission consolidated into 20 per Cent Commission.

Iron work to be supplied complete at 25 per M.l.

Brass work . . . Ditto . . at 80 per Md.

Lead work. . . Ditto. . at 20 per Md.

Master Builder to Indent for all Articles that are in the H. C.'s Stores. To supply all other Articles at the Market Price of the day, the *Master Builder* was relieved from all responsibility which was to be born solely by the Surveyors, and the signing of Receipts was left unprovided for. Upon a subsequent Correspondence, the Deputy Surveyor was in January, 1828, ordered to sign the Daily Receipts.

Testimonials.

TO MR. JAMES KYD.

Public Department.

SIR,

The Commander of the Honorable Company's Ship *Earl of Spencer*, having submitted to His Excellency the Most Noble the Governor General in Council, a Copy of the Letter addressed to him at Sea, on the 23d of October last, by his passengers, in consequence of the very sickly state of the Crew of the *Earl of Spencer*, I am directed by his Excellency in Council to express to you the particular approbation of the Governor General in Council, of your conduct on the occasion.

I am, &c.

(Signed)

C. R. CROMMELIN.

FORT WILLIAM, }
The 1st April, 1801. }

Secy. to Govt. Pub. Dept.

We the undersigned having met and inspected a Plan proposed by Mr. J. Kyd for laying Chain Moorings off the Town of Calcutta, are of opinion that the

Plan proposed by him is far preferable to the one, which we before approved of, for the Moorings.

Mr. Kyd's present plan for laying the Moorings being more secure for Ships, less difficult to be laid, easier to be weighed if required, and less expensive.

(Signed)	C. THORNHILL.	
„	J. SHORE.	
„	H. CHURCHILL.	
„	M. SMITH.	
„	E. BARTLET.	<i>Pilot.</i>
„	JOSEPH WELDON.	<i>ditto.</i>
„	J. WADE.	<i>ditto.</i>

CALCUTTA, }
18th October, 1806. }

TO MESSRS. J. AND R. KYDS.

Master Builders.

SIRS,

I am directed by the *Marine Board* to forward to you, the annexed Extract from a Letter from the Acting Secretary to Government in the Military Department, conveying His Excellency in Council's approbation and applause, of your meritorious conduct and exertions, in preparing the Ships employed as transports for the present Expedition.

I am, &c.

(Signed) ROBERT SCOTT.
Secretary Marine Board.

FORT WILLIAM, }
The 8th April, 1811. }

Extract from a LETTER from the Acting Secretary to Government in the Military Department, addressed to the President, and Members of the Marine Board, under date the 2d of April, 1811.

The Master Attendant having represented to Government, that the public Service is highly indebted to the Honorable Company's *Master Builder*, for his Zeal, Ability, and Exertion in preparing and equipping the Ships employed as transports for the present Expedition, I am directed by His Excellency the Vice President in Council to desire that you will communicate to Mr. Kyd, the approbation and applause which his meritorious conduct, and exertions have obtained from Government.

(True Extract.)

(Signed) ROBT. SCOTT.

Secy. Marine Board.

TO MESSRS. J. AND R. KYDS,

Master Builders.

GENTLEMEN,

The *Marine Board* had much satisfaction in receiving from the Master Attendant, a model for the improvement suggested in your Letter to that Officer, in the mode of strapping Guns for Moorings, accompanied by one of the mode hitherto in use, with a view to contrast the advantages of the former, with the latter method; and I have their orders to inform you, that the Board conceive the improvement to be judicious, and authorize its adoption for the future, especially as the

Master Attendant has stated, that it will be attended with no additional expense.

I am, &c.

(Signed) D. INVERARITY.

Secretary Marine Board.

FORT WILLIAM, }
The 2d July, 1817. }

His Majesty's Ship, *Clorinde*.

ST. HELENA ROADS,

SIR,

May 28th, 1814.

The voluntary and handsome manner, with which you came forward at St. Helena, to direct the repairs of His Majesty's Frigate the *Semiramis*, after that Ship had been run on board by the *Vansittart* (a Merchant Ship) and left in a sinking state, does you honor, and I feel it to be a duty incumbent on me, as the Commander of the convoy, to convey to you my best thanks, for your valuable, and acceptable services upon that occasion.

Captain Richardson of the *Semiramis*, has made particular mention, of your indefatigable attention and exertions; and it is chiefly to be attributed to your skill and professional abilities (as a Ship Builder) that His Majesty's Frigate is again in a condition to proceed to Sea with the convoy.

I therefore beg to repeat to you, the very high sense I have of the service you have rendered His Majesty's Ship, and this valuable convoy by giving it the additional protection of a Frigate, during the voyage to England, and I shall do myself the honor to express my acknowledgements of your zeal, to the Lords Commis-

sioners of the Admiralty, and to the Hon'ble Court of East India Directors.

I am, &c.

(Signed.) THOS. BRIGGS.

JAMES KYD, Esq.

&c. &c.

Passenger on Board the Genl. Kyd.

ADMIRALTY OFFICE,
2d March, 1815.

SIR,

Captain Thomas Briggs of His Majesty's Ship *Leviathan*, having in his Letters of the 25th last month, represented to me, for the information of my Lord's Commissioners of the Admiralty, the very meritorious, and indefatigable exertions made by you, not only in the exercise of your professional abilities as a Ship Builder, but by personally working yourself, in repairing the damages sustained by His Majesty's Ship *Semiramis*, in consequence of her being run on board by the *Van-sittart* Indiaman, in May last off St. Helena, I have it in command from my Lords, to express to you their thanks for your conduct upon the occasion above mentioned: and at the same time I am to request that you will accept of a Piece of Plate, of the value of one hundred Guineas, from my Lords, on which will be inscribed a suitable Testimony of their Lordships approbation, of your conduct, on the Instance in question.

I am, &c.

(Signed) J. W. CROKER.

MR. JAMES KYD,

Ship Builder of Bengal.

SIR,

The Court of Directors of the East India Company, have received a Letter from Captain Charles Richardson, late Commander of His Majesty's Ship *Semiramis*, stating that in his passage home last year, with the India Convoy, the *Semiramis* received so much damage to windward of St. Helena, that it was with the greatest difficulty she could be kept afloat, till the next day when she was towed into the Roads; that you offered your professional Services to repair the damages; which you performed in so Masterly a manner, and with such celebrity, that the Convoy was not delayed by the accident.

In obedience to the Courts Command, I have to express the very high sense they entertain of your meritorious conduct, in the instance above adverted to: and to assure you, that the Court will feel very great satisfaction in communicating to the Bengal Government, the favorable opinion they have of Services so truly valuable, and important to the interest of the Company, and the Nation.

I am, &c.

(Signed) JAMES COBB.

Secretary.

JAMES KYD, Esq.

EAST INDIA HOUSE, }
The 13th June, 1815. }

*Extract of the Public Letter to Bengal, dated
30th June, 1815.*

4. We have recently received a Letter from Charles Richardson, Esq. late Commander of His Majesty's Ship *Semiramis* representing the valuable services of

Mr. James Kyd, one of our Ship Builders belonging to your Presidency, in superintending the Repairs of the Damages, sustained by that Ship, at St. Helena in June, 1814, on the occasion of her being run down by the *Vansittart*, and also in personally assisting, in those repairs, whereby the departure from St. Helena of the fleet of our Ships under the *Semiramis*'s protection was materially expedited.—We enclose a Copy of Captain Richardson's Letter a number in the Packet, and recommend Mr. Kyd to your favorable notice, intertaining as we do, a high sense of his merits, particularly on the occasion to which we have alluded, when the zeal and ability displayed by him, in forwarding the sailing of our Ships, were so conducive to our Interests, and so honorable to his own Character.

Copy Para. for the next General Letter to Bengal.

We have already informed you, that we had granted, Mr. James Kyd permission to return to his professional duties at your Presidency.—This Gentleman embarks on the Ship *Astell*, and we take this opportunity of calling your particular attention to Para. 4 of our Letter to you in this Department of the 4th June 1815, strongly recommending for the reasons therein stated, Mr. Kyd to your favorable notice.

ST. HELENA, *April*, 1826.

TO JAMES KYD, ESQ.

MY DEAR SIR,

I cannot allow myself to proceed further on my passage to England without fulfilling that, which in the ordinary course of things, I ought to have done previously to my departure from India; it is never too

late however to do an act of Justice, and I now avail myself of the opportunity of performing one, to which you have an undeniable claim.—I was aware you might think me insensible to your worth, as a Public Servant of the Indian Government, when I quitted Bengal, without bearing testimony to the value of it ; and therefore, to avoid subjecting myself to such an imputation, I requested Mr. Branch Pilot Clarke to assure you, that I should not fail addressing you from this place, and this is a pledge of the sincerity of that assurance.

I could not have been for so many years, a Member of the *Marine Board*, and latterly in the capacity of its President, without having many opportunities of estimating the value of your Services, as *Master Builder* to the Government, at Calcutta, and on the ground of my own knowledge, and experience, I can venture to assert, that for public zeal, professional talent, and an anxiety to afford satisfaction, to your superiors in the department, you were inferior to no Officer in it ; and I am glad to have an opportunity of bearing my individual testimony to your worth. You are perfectly aware, that I was not at all times pleased with the manner in which things were conducted, but my dissatisfaction arose from my objections to the system, which obtained in the department, and not to the Officers attached to the Establishment ; that I should have been glad to have seen matters put upon a different footing, I must acknowledge, but it is not necessary for me to enter into so intricate and delicate a subject at this time, in order to point out the obstacles, which opposed themselves to the introduction, of a new order of things.

I shall be glad to hear, that some improvements have taken place in the Marine Department, with which I

was too long, and too intimately associated, not to take a lively interest about it.—It will equally gratify me to learn, that you are likely to extricate yourself from your embarrassments, and with my sincere wish, that a period of troubles may be succeeded by one of happier prospects.

Believe me to be,

My Dear Sir,

Very faithfully your's.

(Signed) J. P. LARKINS.

To MESSRS. J. AND R. KYDS,

Master Builders.

GENTLEMEN,

I am directed to acknowledge the receipt of your Letter of the 10th Instant, and in reply to inform you, that the Marine Board have every reason to be satisfied with the exertions made by you, to facilitate the outfit of the Transports, and Gun Boats; Services, which in spite of seriously opposing obstacles, were performed in a manner, highly creditable to your Establishment.

I have the honour to be &c.

(Signed) R. SAUNDERS.

Secretary.

MARINE BOARD, }
The 15th of May, 1824. }

To JAMES KYD, Esq.

Master Builder.

SIR,

The Embarkation Committee, having brought to the notice of Government, the sense they entertain of the value of the services rendered by you, to them in aid of

their duties, during the late War. I am directed to inform you, that the value and importance of those, and other services performed by you, during that period, are thoroughly known to Government, and to convey to you the approbation of the Right Hon'ble the Vice President in Council, of the zeal, and attention paid by you, to the public Interests.

I have the honor to be, &c.

(Signed) CHAS. B. GREENLAW.

Secretary.

Embarkation Committee,
FORT WILLIAM,
The 10th March, 1827.

Extract of a LETTER from the Marine Board, to Government dated 5th July, 1826.

We beg to transmit a sketch (the correctness of which may be depended upon) of the advantages derived to the *Master Builder*, both by his Commission, of 10 per Cent, and by his Salary for the last 20 years, from the Public Works, entrusted to him, which appear to us to be extremely small, and to be scarcely more than equivalent to the simple benefit, that has resulted from our having him as a Public Officer, to consult with, on different points, of a professional nature.

It will be seen that the average annual receipts of the *Master Builder*, on account of commission, and Salary for the last twenty years, amount to Sa. Rs. 22,400-3-2, or 1,866-10-11 per mensem.* The Pre-

* 10 Per Cent new work,	Sa. Rs. 5,875	14	8½.
10 Per Cent old work,	8,997	9	2½.
Average Salary,	7,256	11	3.

12)22,400	3	2
1 866	10	11

mises are the Property of Mr. Kyd, but we feel sure, that they could not be rented at a less rate than Sa. Rs. 1,500 per mensem, and the Establishment, European, and Native must be proportionately large. It is true, that these Premises, and this Establishment, are also occupied with private Works, but they are specially devoted to those of the Government, and considered to be always at their command, and indeed through the Public Spirit of Mr. Kyd, they are to all intents and purposes, as available to the Public Service, on all occasions, as if they were the actual property of the Company. Small however has been the remuneration of the *Master Builder*, during the last twenty years. It is evident that even if the New Works were continued to Mr. Kyd, there is little prospect of future years ever averaging the amount of the past, but by depriving Mr. Kyd of the new works, and throwing them open to Competition, a measure by which the Government ensure their being executed at the most moderate terms, his remuneration will be reduced one third, as regards his percentage.—To make up for this *as well as from a principle of common equity*, we recommend the abolition of the Salary, and Establishment, and the substitution of a percentage of 20 instead of 10 per Cent.

Nor can we close this address, without bearing Testimony to the unwearied Devotion to the Public Service of Mr. Kyd, during the whole period of our Official acquaintance with him; Mr. Kyd has been employed under Government during the course of the last Twenty-five years.—Twenty of which have been passed by him in the capacity of *Master Builder*, and five of that time of Assistant, in the same Office, and when we ad-

vert to his length of Service, and the ample Testimonials of approbation, which he has received from the Court of Directors, the Supreme Government, and this Board, and to the notoriety of the little advantage, that he has derived from the Government works ; we trust that we shall not be considered as exceeding what is reasonable, if we venture to recommend besides the augmentation of percentage as above suggested, that Mr. Kyd may as a special Indulgence (to be considered exclusively personal to himself) be allowed to draw the allowance of 250 Rs. per mensem, under the new arrangements.

Report of the special Telegraphic Committee, appointed to Survey and Report, upon the Steam Engine, and Boring Machinery, Erected in the Arsenal of Fort William, by Mr. Kyd.

The Committee, having met on the 12th January, 1824, according to appointment, proceeded to examine the Machinery Erected by Mr. Kyd, and have the honor to report, for the information of the Military Board, that the manner, in which the Steam Engine, and Boring apparatus is *Erected*, appears very satisfactory, and in every respect highly Creditable to Mr. Kyd.

The Engine being started, was found to work well.

The situation, in which the Engine has been fixed, being necessarily in many respects different from what had been intended, as shewn by the Length of the Steam-pipes, &c. as received from Europe, led to considerable practical difficulties, which have been very ingeniously overcome by Mr. Kyd, who appears to have effected the whole arrangement in a very complete, and Masterly manner.

All the masonry, and wood work, &c. which it has been necessary for Mr. Kyd to make, appears of the best quality.

The accompanying paper delivered by Mr. Kyd to the Committee, fully details the peculiar nature of the difficulties, which it appears he has had to encounter.

Annexed is a List of the nature, and quantity of work executed by Mr Kyd, beyond the original Estimate, the expense of which, the Committee are of opinion could not previously have been calculated upon.

The Committee in concluding their Report, feel themselves called upon to state, that many parts of the original Machinery, more particularly the Mill work, and beds of the Boring apparatus, appear of inferior construction, and *workmanship*; and should any defect arise in the Boring, and turning of the Guns, that it probably will be attributable to the imperfection of this Part of the Machinery.

It is to be understood, that the Committee have merely inspected the Engine, and its Machinery at work without any blocks of Guns being attached to it.

(Signed) T. WOOD, *Lieut.-Col. President.*
 „ T. BLACKER, *Colonel.*
 „ SAML. PARLBY, *Capt. Model Master.*
 „ G. HUTCHINSON, *Capt. Engineers.*
 „ W. W. FORBES, *Lieut. Engineers.*

12th January, 1824.

23d December, 1830.

TO JAMES KYD, Esq.

MY DEAR SIR,

I cannot quit India, perhaps for ever, without conveying to you my sincere wishes for your prosperity

and welfare, satisfied as I am by many years personal acquaintance with you, of your just title to esteem and regard in private life: I am not less sensible of your public claims, and services, many of these have been noticed with high approbation, on the records of Government, others are of a nature to which my Testimony would be of no value; But I have personally experienced your disposition to give your time, and talents, towards the promotion of objects of public advantage, without the expectation or desire of any return, and I trust that your zealous and unremitting Exertions will lead to more favorable results, than heretofore, and that success, and prosperity may attend you.

I visited the *Investigator* yesterday, and was much pleased with all I saw on board.

I remain,

My Dear Sir,

Very faithfully your's.

(Signed) W. B. BAYLEY.

Extract of a LETTER, from Mr. PACKENHAM, Private Secretary to the Governor General, dated 18th January, 1832.

His Lordship desires me to add, that in addressing the Letter to him, there was no violation of the forms of Office, but he did not see in your case any grounds for departing from the rules, which had been laid down for conducting public business, during his absence from the Presidency. He desires to add his Testimony to your great merits, as a servant of the Government, to assure you that no offence or dissatisfaction will be felt at your appealing regularly to the Court of Directors, and to

say, that it will afford him much satisfaction, at all times to hear of your welfare.

I am, dear Sir,

Your's very faithfully.

(Signed.) THOS. PACKENHAM.

To J. KYN, Esq.

Correspondence,

(Continued.)

To J. KYN, Esq.

Master Builder.

SIR,

I am directed by the *Marine Board*, to acknowledge the receipt of your Letter, under date 20th October last, with its Enclosure, and to forward for your information, the accompanying Copy of a correspondence with Government as per Margin.*

2. You will perceive, that Government have deemed it proper to direct the Orders already given, for the repairs of Government Vessels, being put to open Competition, to be carried into Execution, reserving to you a preference, in the event of your Tender happening to be equal, to the lowest Tenders of other Individuals.

3. The Board would gladly have recommended an extension of this preference, only, that it would in effect nullify the object, in inviting Tenders. Under these circumstances therefore, they trust that you will make a

* Board's Letter to Government, dated 25th October.
 Letter of Mr. Offg. Sec. Bushby, dated 22d November.
 Board's Letter to Government, dated 29th November.
 Mr. Secretary Bushby's Letter, dated 14th December.

Tender, by offering the rate of Commission, which you would agree to charge on the rates herewith sent, subject to the annexed Regulations for the due execution, &c. of the work.

4. As these Regulations differ little, from those under which you have so long executed the Repairs, no remarks appear to be necessary on them; Advertisements for Tenders will appear in a few days.

5. Concurring as the Board fully do, in the Sentiments contained in the 3d Para. of *Mr. Officiating Secretary Bushby's* Letter of the 6th Instant, they will very readily report their opinion, as to the Remuneration, to which they consider you to be entitled, when they have made the necessary enquiries on the subject.

I have the honor to be,

Sir,

Your most obedient Servant.

(Signed) C. B. GREENLAW.

Secretary.

FORT WILLIAM,
Marine Board Office, }
The 16th December, 1831.

The Honorable,

SIR C. T. METCALFE, Bt.

Vice President in Council.

HON'BLE SIR,

We have the honor to submit, at the request of Mr. Kyd, the accompanying original address to the Honorable the Vice President in Council, under date 19th In-

stant, preferring his claim to execute the Government Repairs, and soliciting that a special Committee may be appointed to settle the System in such a manner, as shall put the prices to be charged beyond suspicion.

2. The late Finance Committee did, as urged by Mr. Kyd, in their Report, dated 13th August, 1829, state that under all the circumstances of the case, they consider it best for Government to avail themselves of the benefit of his Services. In their report however of the 2d January, 1830, consequent on instructions to reconsider the question of the Office of Surveyor, which involved that of the Repairs; they say “Mr. Kyd * should “have no preference if not willing to work on as moderate Terms as others, giving equally good work.” And again, “we † entirely Concur in the opinion, that “the System of open contract should be extended as “far as possible; and consider it to be highly desirable, that all charges of Mr. Kyd, or other *Builders* to “whom Government may assign the annual Repairs of “its Vessels, should be regulated according to a fixed “Rate, frequently revised.”

3. The Governor General in Council, in the Resolution of Government, dated 24th August, 1830, adverting to the question of Repairs, though fully concurring in the testimony born by the Finance Committee to the Character of the work executed by Mr. Kyd, “which is “universally allowed to be of a very superior quality,” observes “but notwithstanding all these circumstances in favor of the existing System, His Lordship

* 17 Para.

† 18 Para.

“in Council is not quite satisfied that the Government work might not be procured to be executed cheaper, more especially at times, when the several building Establishments have difficulty in procuring work enough to give them constant employment.”—On these grounds it remains to be determined, “whether the Government work in the way of Repairs should not be laid open to annual Competition.” The subject was stated to be still open for consideration, and in the 9th Para. of *Mr. Secretary Prinsep’s Letter*, under date 29th August, 1830, we were directed to consider, and report as to the possibility of executing Repairs, &c. by annual Tender, with a view to a reduction of the rates of charge.

4. Our report on this matter was comprized in the (1st) first Para. of our Letter, No. 413, dated 29th November last, the substance of which was as follows, that, being convinced of the skill and professional abilities of Mr. Kyd, as well as assured of the superior execution of his works, and the convenient situation of his Premises, if we were only quite satisfied of the moderation of his charges, we should not be disposed to recommend any reference to Competition.—Having, however some doubt in respect to the rates of Charge being as moderate as they ought to be, and adverting to the difficulty of ascertaining the fact, we considered, if it was only to settle that Point, that the Repairs should be put up to open Competition—Government concurred in this view, and it was ordered to be adopted in *Mr. Officiating Secretary Bushby’s Letter* of the 8th March last.

5. It must be for Government to say, whether Mr. Kyd has now shewn any sufficient ground, for annulling the intended reception of Tenders, by open Competition. That Mr. Kyd has a strong claim on the Consideration of Government, on the score of his long, and able Exertions in the public Service, as well as from the length of Time, during which the Proprietors of the Establishment at *Kidderpore* have been employed (under the designation of *Master Builder*) to build Government Vessels and execute the necessary Repairs, as from the Circumstance under which the appointment was originally made, and subsequently confirmed by the Hon'ble Court of Directors, whence he had no ground for believing, that such a Change as that now in contemplation would ever have been made, we think cannot admit of a doubt; but it is entirely another thing whether it extends to the right of executing the Repairs of Government, or that there exists any thing in Mr. Kyd's connection with Government, which precludes their equitably effecting any alteration, that they may deem proper in the existing System.—As before stated, we know of no means so certain of securing a proper rate of charge, as that of open Competition: and we are led to think this would be maintained, but we are far from wishing that in effecting the change, regard should not be had to Mr. Kyd's general Claims, and we are of opinion, to mark these, either that a certain degree of Preference, as to the future execution of the repairs should be shown him, or that some Remuneration, such as the circumstances of the case may seem to require, should be afforded to him, in testimony alike of his merits, and long services, and in compensa-

tion in some manner, for the loss which he must inevitably sustain.

We have &c.

(Signed) G. CHESTER.

H. SARGENT.

FORT WILLIAM,
Marine Board, }
The 25th October, 1831. }

TO THE MARINE BOARD,
GENTLEMEN,

I am directed by the Hon'ble the Vice President in Council to acknowledge the receipt of your Letter, dated the 25th of October, with its Enclosure, from Mr. Kyd, and in reply to request, that the Board will state what is really the interest of the Government, without reference to that individual, to continue having the repairs of Government Vessels executed by the *Master Builder*, or to put the work up to general Competition; and in the event of its being decided, that the latter is best for the public Service, the Board will be pleased to explain in what way the preference alluded to, in the concluding part of their Letter under acknowledgment, can be shown to Mr. Kyd, or what Compensation they think him justly entitled, in consequence of the change of system.

I have, &c.

(Signed.) G. A. BUSHBY.

Offg. Secy. to Govt.

COUNCIL CHAMBER, }
The 22d November, 1831. }

To the Honorable,

SIR C. T. METCALFE, Bt.

Vice President in Council.

HON'BLE SIR,

We have the Honor to acknowledge the receipt of *Mr. Officiating Secretary Bushby's Letter*, under date 22d Instant.

2. There cannot be any doubt whatever, that without reference to Mr. Kyd, it is for the Interest of Government to put the repairs of their Vessels up to open Competition. On this Point we have never entertained or expressed any doubt.

3. Touching the degree of preference to be given to Mr. Kyd, under a system of open Competition, or the Remuneration which should be granted to him, in testimony alike, of his merits, and long services, and in compensation in some manner, for the Loss he must sustain, in the event of his being thence deprived of the repairs, we would observe that as regards the former, any thing beyond the acceptance of his Tender, in preference to another, at the same rate of Commission, both being the lowest rates tendered, would have the effect of invalidating the whole object, since it would prevent all future competition.

We would give Mr. Kyd every preference which did not tend to defeat the object of throwing the repairs open to Competition, and it appears to us, the above is the only advantage, that we could give him, which would not have that effect.

4 But to enable this preference to be accorded to him, it is necessary that he should tender. This he has hitherto abstained from doing, and we think it would be proper that he should be apprized, that unless he does

tender, it would be out of the power of Government to continue the works to him, under any circumstances.

5. We are just on the point of submitting to parties inclined to tender, a revised scale of rates of Charge, each of those* who have tendered, having more or less objected to the rates prepared by the Surveyor. In consequence of this, we requested that each would return to us, the Tables corrected, with the rates which they would propose, and we have caused fresh Tables to be prepared, retaining the rates not objected to, and altering the others, with reference to those proposed.

6. These revised statements are nearly prepared, and we would solicit the sanction of Government, to our forwarding a set of them to Mr. Kyd, with intimation that unless he tenders, the government will be unable to continue the Work to him.

7. Being desirous of receiving the sanction of Government to this proposition, we have not delayed its submission, until we can enter upon the extent of Compensation, to which we think Mr. Kyd justly entitled, in the event of the Execution of the repairs being removed from him, by the change of system. We shall submit a separate report on this head as soon as we have made the enquiries necessary, to enable us to arrive at a satisfactory conclusion upon the subject.

We have &c.

(Signed) G. CHESTER.

“ H. SARGENT.

FORT WILLIAM,
Marine Board, }
 The 29th Nov. 1831.

* The Howrah Dock Company. Mr. Geo. Reeves, late Deputy Surveyor and Messrs. Montgomery and Co.

TO THE MARINE BOARD.

GENTLEMEN,

I am directed by the Honorable the Vice President in Council, to acknowledge the receipt of your reply dated the 29th ultimo, to my Letter of the 22d, and to state, that as the public Interests in your opinion will be best consulted, by putting the repairs of Government Vessels up to open Competition, Mr. Kyd's, application to have the work continued to him, as *Master Builder* cannot be complied with.

2. You will be pleased to communicate this determination to Mr. Kyd, and to inform him, under what circumstances, a preference will be given to his Establishment.

3. You will at the same time inform him, that the Government entertains a high esteem for his Character and fully appreciating his professional merits, and services, would gladly have assented to his proposals, if it had been consistent with public duty to do so.

I have &c.

(Signed) G. A. BUSHBY.

Off. Secy. to Govt.

COUNCIL CHAMBER, }
The 6th December, 1831. }

*TO C. B. GREENLAW, Esq.**Secretary to the Marine Board.*

SIR,

I have the honor to acknowledge the receipt of your Letter of the 16th ultimo, communicating the sentiments of Government, upon my Appeal for a continuation of the Government work, according to the principles

which have governed my appointment as *Master Builder* and in reply, have to express my deep regret that the Government should so unhesitatingly arrive at the determination they have adopted, without as I humbly submit, proceeding to an enquiry into those facts which would have been elicited by a competent Committee, and where argument, and illustration could be adduced, to strengthen the claims already urged, upon their notice.

The force of those claims is not, I conceive, affected by the opinion of the Board from their acknowledged inability, to form any judgment, as to the propriety of the charges.

Having already a Contract with Government, at rates established by the Board, after many years experience, and close investigation through the Surveyor, I could not with consistency submit tenders, without derogating from a system, which has been framed with a view to the utmost practicable economy, and moderation of charge, after affording a reasonable recompence to myself.

By uniting voluntarily with the Private Builders of the Port in preferring tenders, I should be necessarily placed upon a level with them, and thereby disclaim any merit for past services, or any title to the consideration of Government, other than that which private individuals possess. I have attempted, (however unsuccessfully) to establish higher claims upon Government, and to maintain the rights which belong to me exclusively as *Master Builder*.

Being thus unfortunate in the result of my application to Government, I trust that the Board will be pleased

to recommend, and the Government to sanction, that I shall be allowed the option of executing the repairs at the lowest Tender offered, as the only alternative now reserved to me, against the most ruinous consequences, until, with the permission of Government, I transmit a humble Appeal to the Hon'ble The Court of Directors. As I have the honor to possess the flattering testimony of Government, I respectfully hope, that my present solicitation, will be favorably received and acquiesced in.

I have the honor to be,

Sir, &c.

(Signed) J. KYD,

Master Builder.

KIDDERPORE, }
4th January, 1832. }

TO JAMES KYD, Esq.

Master Builder.

SIR,

Copy of your Letter under date 4th Instant, having been submitted for the consideration, and Orders of Government, I am directed by the *Marine Board*, to forward for your Information, the accompanying Copy of *Mr. Officiating Secretary Bushby's* Letter under yesterday's date.

I have the honor to be,

Sir,

Your most Obedient Servant.

(Signed) C. B. GREENLAW.

Secretary.

FORT WILLIAM, }
Marine Board Office. }
The 7th January, 1832. }

*TO THE MARINE BOARD,
GENTLEMEN,*

I am directed to acknowledge the receipt of your letter dated the 5th Instant, with its enclosure from MR. KYD, and in reply to inform you, that the Vice President in Council cannot sanction MR. KYD's proposal, that without Tendering himself, for the repairs of Government Vessels, he be allowed the option of executing the work, on the lowest terms offered by other Individuals. Such an understanding would be tantamount to a prohibition of Tenders altogether.

I have &c.

(Signed) G. A. BUSHBY.

Offg. Secy. to Govt.

COUNCIL CHAMBER, }
The 6th January, 1832. }

TO JAMES KYD, ESQ.

SIR,

With reference to the correspondence which has taken place relative to the Repairs of Government Vessels, I am directed by the *Marine Board* to inform you, that they have accepted of a tender from the Howrah Dock Company for the execution thereof, from the 1st proximo, from which date the Officiating Master Attendant has been instructed to send all Vessels, Boats, &c. requiring repair to the Dock Yard, of that Establishment.

2. Captain Collie has also been desired to receive from you all Boats, Buoys, and Stores of every description which may be in your charge, and to transfer them to the Howrah Dock Companys Premises, furnishing

you with receipts for the same; that for the Stores supplied for* the Current Repairs to be separate from that for the Boats, &c. in order that on its transmission to this Office, it may be sent to the Naval Store Keeper, with a view to your obtaining credit for the same on the Books of his Office. I am further to request that you will at the same time, as early as convenient, make a return indent of all unserviceable Stores requiring to be sold, in order to their being made over to the Naval Store Keeper, for that purpose. The Godown and Shed hire, amounting to Sa. Rs. 100 per mensem, is to cease from the 1st proximo.

In making this communication to you, I am directed to express the regret of the Board, that any Circumstances should have occurred, rendering it expedient to adopt measures by which the connection between this Department and yourself, has been severed, nor can they allow this to take place, without bearing their amplest Testimony to the skill and ability, which have been exhibited by you, during the whole period of your Services, as well as to the Cordial Assistance which you have frequently afforded the Department, on Points not within the scope of duties, required by your situation.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed) C. B. GREENLAW.

Secretary.

FORT WILLIAM,
Marine Board Office,
The 19th January, 1832. }

TO CHARLES B. GREENLAW, ESQ.

Secretary to the Marine Board.

SIR,

I have the honor to acknowledge the receipt of your Letter of the 19th instant, and beg to observe, that from the absence of the usual designation in all Letters to my address, from the Board, I am led to suppose that I am virtually deprived of the Office of *Master Builder* to the Hon'ble Company, to which I was appointed in 1805, and subsequently confirmed by the Hon'ble the Court of Directors. My supposition is supported by the regret, the Board desire you to express "that any circumstances should have occurred, rendering it expedient to adopt measures, by which the connection between the Board and myself, has been severed."

The circumstance of the contract accepted by the Board, from the Howrah Dock Company, to repair the Government Vessels for a year, cannot, and does not, I submit, necessarily go to deprive me of my honorable situation, or the appointment of *Master Builder*. The very fact of the Tender being for a short period, seems to indicate, that the proposed change is experimental, and consequently of dubious result. If however it be the Will of Government, that I stand dismissed, I hope, they will be pleased to direct their orders on this point, to be communicated to me Officially. It may not be too much to ask this, after a Service of 31 years, the nature and quality of which, your present Letter has so flatteringly characterized.

The orders however contained in the 2d Para. of your Letter under acknowledgement, shall be duly complied with. I had no doubt that the Howrah

Dock Company would be the parties to take my place.—but I think They, as well as Government, will yet regret the change.

I have the honor to be,

Sir, &c.

(Signed) JAMES KYD.

Master Builder.

KIDDERPORE, }
24th of January, 1832. }

TO JAMES KYD, Esq.

Master Builder.

SIR, . . .

With reference to your Letter dated the 24th ultimo, I am directed by the *Marine Board*, to annex for your Information, copy of a Letter dated the 31st ultimo, from *Mr. Officiating Secretary Bushby* relative to your designation as *Master Builder*.

I have the honor to be,

Sir,

Your most obedient Servant,

(Signed) C. B. GREENLAW.

Secretary.

FORT WILLIAM, }
Marine Board Office, }
The 10th February, 1832. }

TO THE MARINE BOARD,

GENTLEMEN,

I am directed by the Honorable the Vice President in Council, to acknowledge the receipt of your Letter, dated the 26th instant, forwarding a correspondence

with Mr. Kyd, and in reply to state, that, His Honor in Council is not aware of the necessity of depriving that Gentleman of the designation of *Master Builder*, because of the temporary contract, made with the Proprietors of the Howrah Dock, for the Repairs of Government Vessels.

I have, &c.

(Signed) G. A. BUSHBY.

Offg. Secy. to Govt.

COUNCIL CHAMBER, }
The 31st January, 1832. }

TO CHARLES B. GREENLAW, Esq.

Secretary to the Marine Board.

SIR,

I have the honor to acknowledge the receipt of your Letter of the 10th instant, annexing Copy of a communication from Government, in reply to my Letter of the 24th ultimo, conveying their decision, “that I “should not be deprived of my designation, of *Master Builder*, because of the temporary contract made “with the Howrah Dock Company, for the repairs of “Government Vessels.”—Upon this intimation I trust, I may without impropriety submit my claim to the emoluments confirmed to the Office, by the Hon’ble The Court of Directors, which previous to the present change of System, were consolidated into a Commission upon the work, in preference to a fixed salary arising, out of the Appointment.—I hope with reference to *Mr. Secretary Lushington’s Letter* of the 20th July, 1826, the Board will feel themselves justified, in recommending an amount of remuneration, equi-

valent to the advantages of which I have been deprived, and which was previously offered for my acceptance, together with a reasonable compensation for Dock-hire, &c. as suggested in the 5th para. of the Boards Letter to Government, under date the 25th October last. *

As bearing strongly on the merits of the case, I should wish to impress on the consideration of the Hon'ble The Vice President in Council, not only the direct and positive loss, which the utterly unexpected resolution of Government, to deprive me of the ordinary advantages of my Office, entails on me, but that in perfect confidence of the continuation of the Office, and its duties being vested in me during my life, a confidence which the result of the very special inquiry, made into the details of the Office, by the late Finance Committee, further tended to uphold, I have since that result was known, carried into execution a further outlay with reference to the duties of the Office, which I had long contemplated—I allude to the construction of a new Dock, on my Premises, which I was induced to build, in order that I might be able to enlarge the entrance to my old Dock, so as to admit of the docking of the Hon'ble Company's Steamer *Enterprise*, for

* When the Hon'ble the Court of Directors sanctioned the revised Rules, relative to the Office of *Master Builder*, they intimated that they should have preferred the grant of a fixed salary to that Officer. There is also in the opinion of the Governor General in Council, an obvious objection to the principle of paying for any public work by a Commission, on the amount disbursed. It would be desirable consequently, if practicable, on the present occasion of revision, to meet the sentiments of the Honorable Court, on the above point, and I am directed to request, that you will state whether in your judgment the sum of 2,000 Rs. per mensem, would be an adequate salary for Mr. Kyd, instead of the Commission proposed by you, on his disbursements.

want of which, I had been deprived of the repairs of that Vessel. No argument can be necessary to shew, that in the present depressed state of commercial affairs, and particularly as it affects Dock Establishments, to have ventured on an outlay of Capital, on such an undertaking, in the hope of remuneration from the ordinary business of a *Builder*, would have been the extreme of folly, and I shall have credit, when I state unequivocally, that having the most perfect reliance on the permanence of my appointment, and feeling that I am bound to be prepared, to execute any work, which might be required of me—and my Dock not being sufficiently capacious at the Gates, to receive that Vessel, I ventured at a great sacrifice, to construct a new Dock, as above explained, in order to enable me to meet all the Government wants.

It will readily be believed, that if I could have anticipated such an event, as has taken place, I never would have subjected myself to such an Expence, as that which by the present act of Government, is rendered a ruinous one—and I respectfully submit, that in determining the amount of emolument, or remuneration which it may be equitable that I should retain, that this expense incurred, solely with reference to my then existing Engagement with Government, should be taken into consideration.

I have the honor to be,

Sir,

Your most obedient Servant,

J. KYD.

Master Builder.

KIDDERPORE, }
22d of February, 1832. }

To JAMES KYD, Esq.

Master Builder.

SIR,

With reference to your Letter, dated 22d February last, I am directed to forward for your information, the accompanying Copy of the Board's Letter, dated the 10th, to the address of the Vice President in Council, and also of Mr. Officiating Secretary Bushby's Letter dated the 27th ultimo in reply, relative to a remuneration proposed to be granted you.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed)

C. B. GREENLAW,

Secretary.

FORT WILLIAM,
Marine Board Office,
the 3d April, 1832.

}

To THE HON'BLE SIR, C. T. METCALFE, Bt.
Vice President in Council.

HON'BLE SIR,

We have the honor to acknowledge the Receipt of Mr. Officiating Secretary Bushby's Letter under date 31st January last, and to submit for the Consideration and orders of Government, the accompanying Copy of a Letter from the *Master Builder* dated 22d Ultimo.

2. We have already, in the concluding Paragraph of our Letter under date 25th October last, expressed

our opinion, that a certain degree of Remuneration, such as the circumstances of the Case may seem to require should be afforded to Mr. Kyd, in testimony of his merits and long services, and as a compensation in some Measure for the loss which he must inevitably sustain, from the cessation of his connection with the Government, consequent on the change of System, in effecting the Repairs of Government Vessels.

3. In considering however the nature and degree of this Remuneration, we cannot go to the length advanced by Mr. Kyd.—It must be borne in mind, that by the operation of the orders of Government, he was not necessarily deprived of the Emoluments hitherto enjoyed by him, since he had the opportunity afforded him in common with others, of executing the Repairs, had he thought proper to tender for them, and even a certain degree of preference would have been given him over the others Tenders. Mr. Kyd declined altogether making any offer. It cannot then be said that he has been wholly and absolutely dispossessed of the advantages he before had. His situation is not similar for instance to that of a Public Officer drawing a Salary, whose appointment may have been abolished—Nor are the Cases in other respects, as we conceive, analogous to each other.

4. We are however far from meaning to say, that we do not consider Mr. Kyd entitled to great consideration, on the various Grounds we have before urged, although his claims are of a peculiar nature and not we think quite on a footing with those of a public Officer deprived of his situation—such as they are, they are much strengthened by personal considerations, from time to time admitted both by the Government, and the Hon'ble

the Court of Directors, as may be fully seen on reference to the enclosures of our Letter, dated 25th October last.

5. Government are aware that Mr. Kyd has hitherto drawn from the 1st September, 1827, a personal allowance of Sicca Rupees two hundred, and fifty per mensem, and after fully considering the matter in all its bearings, we are of opinion, not only that this should be continued to him, but that it may be fairly increased to Repairs 500 per mensem, to be granted to him, as a retiring allowance. The equity of the case would thus we think be fully met, and a gratifying mark of approbation would be conferred on a Gentleman with whom Government have had long, and extensive dealings, and who, whatever right they had to change the system, under which he worked for them, could himself have been but ill prepared for the change, while he must necessarily have been a loser by the alteration, and have found in it, whatever course he had pursued, a very considerable check, to the general prosperity of his business.

We have the honor to be,

Hon'ble Sir,

Your most obedient humble servant,

(Signed) G. CHESTER.

“ H. SARGENT.

FORT WILLIAM,
Marine Board,
The 10th March, 1832. }

TO THE MARINE BOARD,
GENTLEMEN,

I am directed by the Honorable The Vice President in Council to acknowledge the receipt of your Letter,

dated the 10th instant, submitting a Letter from Mr. Kyd the *Master Builder*, with your opinion, that a certain degree of remuneration should be afforded to him, in testimony of his merits, and long services, and as compensation for the loss, which he must sustain consequent on the change of system, which has been adopted for effecting the Repairs of Government Vessels, and suggesting, that his personal allowance be increased from 250 to 500 Rupees per mensem.

In reply I am instructed to state, that his Honor in Council, cannot grant the retiring allowance suggested by you. The Board are requested to ascertain from Mr. Kyd, whether he wishes the subject of his remuneration, to be referred to the Hon'ble the Court of Directors.

I have the honor to be, &c.

(Signed) G. A. BUSHBY,

Officiating Secretary to Government.

COUNCIL CHAMBER, }
The 27th March, 1832. }

E N D.

APPENDIX.

N. B. The 12th para. of this LETTER is referred to, in a Note, at page 10, but as the whole of it, is of importance, it is given here entire.

TO HIS EXCELLENCY,

The Most Noble

FRANCIS MARQUIS OF HASTINGS, K. G.

Governor General in Council.

MY LORD,

1. We have now the honor to reply to the Letter of the Chief Secretary to Government, dated the 19th August, intimating, that there appears to the Governor General in Council, much reason to think that the whole System, on which the Building and Surveying Departments are at present conducted, stands in need of a thorough revision, and reform, and directing us to take into our consideration, and submit, for the approval and sanction of Government, such Rules as may be best adapted, for the attainment of the objects essential to the due efficiency of the important Departments in question, and calculated to guard the interests of Government, in a quarter demanding particular care.

2. Having, in the first place, deemed it proper to forward the above mentioned Letter to the Master Attendant, desiring that he would submit his sentiments

on the suggested revision and reform in the Surveyor's and *Master Builder's* Departments, the Master Attendant has accordingly addressed us a Letter, dated the 14th September, copy of which, together with copies of it's several enclosures, are herewith submitted to your Excellency in Council.

3. Keeping in view the chief objects to be attained by this Revision, as pointed out by your Excellency in Council, viz.

A more prompt, and efficient Survey of Vessels, reported to require repair.

A strict inspection of Materials used in the repair and construction of Vessels.

A more effectual control during the progress of the work, and

A regular professional Survey after completion; we proceed to submit herewith the result of our deliberations to your Excellency in Council.

4. The duties of the present Surveyor in the Marine Department are multifarious, and lie in places distant from each other, viz. at Calcutta, at Kidderpore, and occasionally at Stations lower down the River. To be enabled to give the requisite attention to the works carrying on at the *Master Builder's Yard*, at Kidderpore, it would be necessary that the Surveyor should constantly reside there, to see that no unnecessary delay takes place in the execution of works ordered, and that the materials used are invariably of unexceptionable quality. But his attendance is also constantly required at Calcutta, besides occasional Services down the River, for the purpose of Surveying Ships,—Duties all of them, which we have felt it to be impracticable for

one Man, however active and laborious, properly to perform. It being therefore our opinion, that additional aid is indispensably necessary to be afforded to the Department of Survey, we have proposed the employment of a Second Surveyor at a Salary of 500 Rs. per mensem. It has appeared to us more conducive to the good of the Public Service, that the Second Surveyor should be independent of the First Surveyor, and that both Surveyors should be placed alike, under the orders, and control of the Master Attendant.

5. Enclosure No. 1, contains the Rules and Regulations we have drawn up for the guidance of the Officers holding the appointments of 1st Surveyor, and 2d Surveyor to the Hon'ble Company, in the Marine Department, and Assistants to the Master Attendant. From the attention of the present Surveyor being so much divided, it has been found impracticable for him to afford such constant Superintendence of the works carrying on at the *Master Builder's Yard*, which is a matter of great importance. We propose by clause 4 of the Rules and Regulations, of the Surveyor's department, that the 2d Surveyor shall reside permanently at Kidderpore, by which means he will be able strictly to examine all the materials used in the Works, and to see that they be of unexceptionable quality—he is also constituted a check over the Workmen, employed in the *Master Builder's Yard*, and will be on the spot to expedite the execution of all orders, which may be given for the Repairs of Vessels, Boats, &c. And for the original construction of Works of every description. He will also furnish to the Master Attendant, to be by him transmitted to the Board, a Weekly Report of all that is going on in that branch of the department com-

mitted to his charge, whence it will be seen if any unnecessary delay in the execution of Works has taken place, both Surveyors being required, by Article 5, to obey, without reference, all orders given to them by the Master Attendant. The 2d Surveyor, in the absence or sickness of the 1st Surveyor, will be liable to be called upon to perform the duties attached to that situation, as will the 1st Surveyor, in like manner, during the absence or sickness of the 2d Surveyor.

6. Article 6th, provides more effectually than heretofore, for the efficient Survey of Vessels, &c. requiring Repairs. We attach considerable importance to the Master of such Vessel being present at the Survey, to point out to the Surveyor's the defects he may have observed in her, and her general state and condition, with which he must be better acquainted, than any other person, and we ascribe the defectiveness of some former Surveys, to the disregard paid by the Surveying Officers, to the opinion given by the Master of the Vessel.

7. The reports prescribed by Article 10th to be furnished weekly by the 1st and 2d Surveyors, regarding the progress of all Works conducted under their superintendence, respectively, and of all Surveys held by them, will, it is conceived, sufficiently provide for the due control of those objects, and the certificates required to be furnished by Articles 15th and 16th, after the execution of the Work, and the examination of the bills shall be completed, appear to us to promise as much efficiency as is attainable. In the Survey of all Works after their completion, we have thought it proper, by Article 7th, to associate both the Surveyors, with an Officer of the Master Attendant's Department,

who are all required to attest the form of certificate laid down for that purpose.

8. Articles 10th and 11th will be more fully adverted to, when we come to treat of the revision of the *Master Builder's* Department. The certificate required by Article 10th to be affixed by the Surveyor, and one of the Assistants to the Master Attendant, to the Indents, and the countersignature thereto, of the latter Officer, sufficiently provides against any Work to the amount mentioned being undertaken, excepting it be of immediate necessity.

Having thus gone thro' an investigation of the Rules and Regulations, for the guidance of the Officers holding the appointments of the 1st and 2d Surveyor, we proceed to treat of the Department of the *Master Builder*.

10. On this head, we must premise, by stating, that the *Master Builder*, has expressed to us his dissatisfaction at the existing system for conducting the duties of his Office, which commenced its operation on the 1st May, 1816, chiefly on the ground of the inadequacy of the remuneration afforded to him, and his desire that the system which prevailed previously to 1st May, 1816, should be reverted to.

11. This is in our opinion, quite inadmissible, at the same time, we think, in justice to the *Master Builder*, that some modification of the present System is called for. Our address to Government, under date the 23d August 1815, contains our reasons at large, for recommending the change which was subsequently adopted, and has since been followed. The remuneration to the *Master Builder* previous to 1st May. 1816, consisted.

1st Of an Establishment amounting with Ground and Godown Rent, to Sa. Rs. 820 per Mensem.

2d Of a Commission at the rate of 10 per Cent. on that part of the Actual Disbursements made by him for work executed, on which his labour and skill in Superintending the same should be bestowed. Tools out of the Company's Stores being supplied to him for his use. By the present mode, the remuneration granted to the *Master Builder* is limited to a Commission on those Disbursements, at the rate of 12 per Cent. which includes a consideration for all purposes.

12. The usual charge made by *Ship Builders* in this City for conducting the Repairs of Ships and Vessels, is, we understand, 20 per Cent. Of this, 10 per Cent. is supposed to cover the charges for Establishment and Workmanship, and 10 per Cent. to remain clear profit to the *Builder*. Our Letter of 23d August 1815, above referred to, shews, that Mr. Mathew Smith, a Ship Wright, was willing to undertake to perform the Company's Business, on being allowed a Commission of 12 per Cent. In acceding to this arrangement, he was swayed, probably, more by the distinction of becoming *Master Builder*, to the Company, and the certainty of being retained on their constant employ, than by the fair remuneration for his charges and labour, which such a per Centage would afford him. Messrs. Kyd on the other hand, under an impression, it may be supposed, that if they refused to work on terms equally low, as those which another had agreed to do, and which we were directed by Government to offer them, they would run the risk of losing the Company's Business, did, in the words of their acquiescence,

which we quote below, imply some degree of uncertainty, as to the result being favorable to them.

“ An anxious wish to meet the views of Government
“ in every respect, is a sufficient inducement for us to
“ endeavour to perform the Hon’ble Company’s business,
“ agreeably to the plan submitted to us, and we
“ therefore beg, with the utmost deference and respect,
“ to state, that we shall use every exertion in our power
“ to conduct the Hon’ble Company’s Work as proposed
“ therein, and in the event of its being out of our
“ power to perform it on such terms, without injury
“ to us, we shall deem it our duty to solicit the attention
“ of the Board, to such parts of the arrangement as
“ may appear, on trial to be impracticable.”

13. We submit the copy of a Letter, dated 3d August 1819, received from the *Master Builder*, with copies of two statements which accompanied it, intended to show the losses sustained by him, in three Years of the New System, when he was paid solely by commission, at the rate of 12 per Cent on his disbursements, contrasted with the three preceding Years of the Old System. when he was paid by a commission of 10 per Cent, on similar disbursements, and by allowances, Establishment, and Extras. Those statements were sent to the Naval Store Keeper, for comparison with his Books. The comparison was accordingly submitted by us to him, but it appearing that more work had been performed by the *Master Builder* during the then Current Year 1819-20, whence he would derive a higher Amount of Commission, than in the three preceding years, the Naval Store Keeper was directed to carry on the comparison to the close of that year. A copy of the

correspondence, as noted at the foot of the page* is herewith transmitted, for the information of your Excellency in Council.

14. The result of the Comparison is as follows :

FORMER SYSTEM, FOUR YEARS.

The *Master Builder's* Allowances and Establishment, at Sa. Rs. 820 per Month for the years 1812-13, 1813-14, 1814-15 and 1815-16, the last of that System 39,360 0 0

The Amount of Extras allowed to the *Master Builder* during the same period, as per Naval Store Keepers' Statement, dated the 16th November 1819.... 12,314 2 8

Sa. Rupees 51,674 2 8

PRESENT SYSTEM 4 YEARS.

Amount of Commission drawn by the *Master Builder* on his disbursements at 10 per Cent.

1812-13..... 24,545 8 6

1813-14..... 14,264 11 10

1814-15..... 16,313 14 3

1815-16..... 8,130 1 4

63,455 3 11

1,15,129 6 7

* Letter to Naval Store Keeper dated the 11th August 1819.
Ditto from ditto the 16th November, with Enclosures.
Ditto to ditto dated the 17th ditto.
Ditto from ditto dated the 12th January 1820.
Ditto to ditto dated the 14th June, ditto.
Ditto from ditto dated the 25th July, ditto with Enclosures.

APPENDIX.

xi

Amount of Commission paid to the *Master Builder* at the rate of 12 per Cent. during the undermentioned years.

1816-17.....	18,757	9	11*
1817-18.....	5,667	11	3†
1818-19.....	9,425	9	9‡
1819-20.....	28,088	11	0§

61,929 9 11

The Amount of Extras
Boat hire, &c. allowed the
Master Builder during
the above period....

366 5 1

62,295 15 0

Sa. Rupees 52,833 7 7

Whence it appears, that the *Master Builder* has received during the last four years, under the present System, a sum short by Sa. Rs. 52833 7 7 of what he would have drawn, had he continued to act under the former System—The *Master Builder* errs, in stating, as he has done, that the compensation settled by the New System, was on the principle, that 2 per Cent. on the amount of his disbursements, would be equivalent to the Commis-

* In the year 1816-17, in addition to the necessary repairs to the Pilot Schooners, Row Boats, &c. the Surveying Ships *Near-chus* and *Minto* were repaired, and 16 Row Boats built.

† In 1817-18, the work done was confined to the repairs of Pilot Schooners, Row Boats, &c.

‡ In 1818-19, in addition to the necessary repairs done to the Pilot Schooners, Row Boats, &c. seven Transport Ships were fitted out for the conveyance of Troops.

§ In 1819-20, in addition to the necessary repairs, to the Pilot Schooners, Row Boats, &c., the *Torch* and *Planet*, light Vessels were refitted, 2 Sets of Calcutta Cham Moorings, and One Set of Kedgerree Moorings were made, and two New Pilot Schooners and eight New Row Boats were built.

sion, and Allowances which he drew under the Old System,—at the same time, it appears, that in those years, when a great deal of New and Costly Work is done, a Commission drawn by the *Master Builder* at the rate of 12 per Cent. on his disbursements, may amount, as it did in the year 1819-20, to £8,088 11 0, a sum exceeding what a Commission at 10 per Cent. with a Salary, Establishment, and Tools, would, in ordinary years, yield him, as is shewn below*.

15. With regard to the agreement to be entered into with the *Master Builder*, what we have now the honor to propose No. 2, differs from the existing Agreement in the following respects.

First. It proposes by Articles 1 and 2 to remunerate him by a Commission of 10 per Cent. upon his disbursements; By a Salary and Establishment at the rate of 670 Rupees per Month (Short by 150 Rupees per Month, of what he drew previously to the existing agreements, that sum being his allowance of Assistant to

* In 1813-14 Commission drawn by the *Master Builder* at 10 per Cent. Sa. Rs. 14,264 11 10

Salary, Establishment, and Extras for 4 years	Sa. Rs. 51,674 2 8,	
(see para. 14 of this address) average of 1 year.....	12,918 8 8	
	<hr/>	27,183 4 6

In 1814-15 Commission drawn by the *Master Builder* at 10 per Cent. 16,313 14 3

Salary Establishment, and Extras average of 1 year.....	12,918 8 8	
	<hr/>	29,232 6 11

In 1815-16 Commission drawn by the *Master Builder* at 10 per Cent. Sa. Rs. 8,131 1 4

Salary, Establishment, and Extras average of One year.....	12,918 8 8	
	<hr/>	21,049 10 0

the Master Attendant not now intended to be revived) and by furnishing him with Tools, according to the former System, instead of allowing him to draw a Commission at the rate of 12 per Cent. on his disbursements, which now constitutes the whole emolument he derives from the Company.

It has been shewn in para. 14 of this address, that, in the year 1817-18, when the *Master Builder's* work was confined to the repairs of Pilot Schooners, Row Boats, &c. the remuneration, granted to him, at the rate of 12 per Cent. on his disbursements, did not amount to 500 Rs. per month, and in the year 1818-19, when, in addition to the before mentioned current repairs, several Transports were fitted out, for the conveyance of Troops, that the sum received by him did not amount to 800 Rs. per month—a degree of remuneration which we believe your Excellency in Council will agree with us in thinking to be quite inadequate to reward the *Master Builder* for his skill, and trouble, and to provide for the expensive Establishment, he is obliged to keep up. It is true that in those years, when a number of New Works were carried on, a Commission on his disbursements, at the rate of 12 per Cent, does afford him what may be considered an adequate reward. This was the case in the year 1819-20 when he drew Sa. Rs. 28,088 11 0. Such years, however, rarely occur, and it seems to us to be equitable, that the *Master Builder* should be rewarded in a more equable manner, that is, partly by a fixed salary, and Establishment, which will be certain, whatever may be the quantity of work performed by him, throughout the year, and partly by a Commission on Work executed at a reasonable rate, in the manner we have recommended.

Second. By article 3d the *Master Builder* is allowed to employ Extra European Carpenters, Sircars, and Writers, beyond the number fixed for his Establishment, as in the agreement of 1805, should there be an indispensable necessity for so doing, of which the second Surveyor is constituted the judge.

Third. Article 8th regulates the prices to be paid for Iron, Copper, and Lead Work, in conformity to the principle authorized by the Letter, from the secretary to Government, in the Public Department, dated the 15th Augt. 1817, viz. at the rates at which the *Master Builder* receives those Metals, from the Public Stores, adding thereto the fixed rates of labour. There was a discrepancy between Articles 6 and 9 of the last agreement. By the former, the *Master Builder* was allowed to furnish Iron at the market price, if none of the quality he wanted, was procurable from the Company's Stores. By Article 9 Stores of every description were to be furnished from the Import Ware-House, or Naval Stores. Such discrepancy is now removed, all metals, as well as other stores (with the exceptions mentioned in Article 11th) are to be supplied, from the Hon'ble Company's Ware-Houses.

Fourth. Article 9th provides for the *Master Builder's* being allowed to draw from the Company's Stores, and to be used exclusively in their Work, the Tools therein mentioned—this is conformably to the system of 1805.

Fifth. By Article 11th it is proposed, that the *Master Builder* shall supply, besides Timber, and Plank (according to the existing Agreement) Blocks and Spars, when not in the Hon'ble Company's Stores,

and also at the market prices of the day, certain Articles, which are enumerated, composed of Wood, and Iron, which more appropriately belong to his department, of the quality of which the 2d Surveyor, to be stationed at Kidderpore, will be able fitly to judge, and the supply of these Articles by the *Master Builder*, preferably to his obtaining them, on an Indent from the Import Ware-House Keeper, will induce a considerable saving of time.

Sixth. By Article 12th, the mode of supplying Funds to the *Master Builder* is proposed to be altered. According to the former agreement, a credit was allowed him on the General Treasury, to the amount of Sa. Rs. 20,000 to be drawn by him in Sums, as required—but as he had to pay the Import Ware-House Keeper, for all the Stores wherewith he was supplied by that Officer, and sometimes to a large amount, at one time, we, in so fluctuating a state of things, never knew how the account stood between them, nor what proportion of the sum of 20,000 Rs. was actually at the *Master Builder's* command. The better will be, we conceive, the one now in contemplation, viz. that one-third of the amount of the *Master Builder's* Estimates shall be advanced to him, on their being approved, by the Board. This proportion of advance will suffice to cover the *Master Builder's* outlay for Timber, Plank, and other Articles to be supplied by him, agreeably to Article 11th, and for the charges of Workmanship—the Import Ware-House Keeper and Naval Store Keeper debiting the *Master Builder* for the value of all Stores supplied by them to that Officer, and he giving a corresponding Credit for the same in the Hon'ble Company's Quick Stock.—According to the present mode of con-

ducting the business, Money is drawn from the Treasury by the *Master Builder*, to be paid by him, to the Import Ware House Keeper, to be by him remitted back to the Treasury, which appears to involve a useless multiplication of trouble.

Seventh. Article 13th differs from Article 12th of the former agreement, in as much as the Stores supplied to the *Master Builder*, by the Import Ware House Keeper and Naval Store Keeper, are not to be paid for, by the former Officer, and the advance to be made to him by Article 10th differs from the mode directed by Article 11th of the former agreement.

Eighth. Article 14th corresponds with Article 13th of the former agreement, excepting that the 2nd Surveyor stationed at Kidderpore, is required to be the Superintending Officer, by whom the check book is to be kept.

Ninth. Article 15th specifies the fixed prices at which the 1st and 2d Class of Boats for the Pilot Schooners are to be supplied by the *Master Builder* agreeably to the Contract with him, these points being left indefinite by Article 14th of the former agreement.

Tenth. Article 17th is a new one, requisite in consequence of the proposed change of System, and to correspond with that of 1805—According to the present System the *Master Builder* holds no Quick, or Dead Stock on account of the Company.

16. We beg leave to observe that the foregoing proposed Articles of Agreement, have been shewn to the *Master Builder* who is willing to act upon them.

17. Enclosure No. 3 contains the Rules, and Regulations we would recommend, to be adopted for the guidance of the *Master Builder* in conducting the

duties of his Office, and we proceed to exhibit a Comparison of them, with the Rules and Regulations now in force, and to point out in what respects they differ from each other.

First. Article 1 of the last mentioned, provides that the *Master Builder* is on no account, without the previous sanction of the Marine Board, to execute any repairs, to any description of Vessels, belonging to the Hon'ble Company's Marine, or State Establishments. But the Master Attendant has recommended, that the *Master Builder* may be authorized to execute, without reference to the Marine Board, upon his (the Master Attendant's) requisition on Indent, Repairs absolutely necessary, and requiring to be done, without delay, to an estimate amount not exceeding 500 Rupees. Much delay has been experienced, and detriment to the Public Service, by trifling repairs of this nature being suspended until the Estimates for the execution of them, could be regularly passed. We concur therefore, with the Master Attendant, on the expediency of adopting such a Rule, reducing however, the limit of expenditure from 500 to 300 Rupees. The requisition of the Master Attendant stating, that the repairs are absolutely necessary, and require to be done without delay, and bearing on it, the Certificates of one of the Surveyors, and of one of the Assistants to the Master Attendant, to the same effect, will in our opinion be ample security against any abuse of this concession. Articles 1st and 2d provide for this object.

Second. Article 3d provides more efficiently for the proper Survey of Vessels, and other description of work requiring repair, than Article 2d of the existing rules.

Third: Article 7th provides for the more effectual Survey of Works when Completed, than Article 7th of the existing rules.

Fourth. By Article 8th (former part) certificates are to be furnished by the 1st and 2d Surveyors, instead of the former, and the Master Attendant. The 2d Surveyor, under whose Superintendence, the Work is to be conducted at Kidderpore, being the proper Officer to certify as to the Correspondence of the Work done, with the Work described in the Bill, rather than the Master Attendant.

Fifth. Article corresponds with the same Article in the existing Regulations, excepting that the transmission of the Estimate by the Master Attendant, to the Naval Store Keeper, is dispensed with, as unnecessary, and being a useless consumption of Time.

Sixth. Article provides for the delivery to the 1st Surveyor in the Marine Department, at the beginning of every Quarter, by the *Master Builder* of a Statement under his signature, of the Market prices of Timber, and Plank of every description—this is made conformably to the directions of Government, contained in Mr. Chief Secretary Rickett's letter of the 11th of May 1816, whereby Article 10th of the existing rules was modified.

We are, &c.

(Signed)

GEORGE CHESTER,
HENRY SARGENT.

”

MARINE BOARD, }
The 28th February 1821. }

*Extract from a LETTER from the Marine Board
to Government, dated 5th July, 1826.*

N. B.—The 20th para. of this Letter is referred to at page 25, but as the whole of it, as regards the *Master Builder's* department is of importance, it is given here entire.

PARA. 10. We now beg to solicit the attention of your Lordship, to the proposed modification in the Department of the *Master Builder*.

11. The most efficient System would certainly be for the Government to have a Dock Yard, and complete Establishment of their own, as they have at Bombay, and as was originally intended to have been the case here.—Indeed such an Establishment was once in existence on the scite of the Present Bankshall, but the want of room, and the increasing size of the Government business rendered it necessary to remove the Government work to Kidderpore, where it was carried on by the *Master Builder* Mr. Waddell, as a Government Yard, the *Builder* receiving rent for the Premises, which were his own property, and being allowed every charge for the Establishment, together with a salary for himself, and a commission of 10 per Cent., on the amount of works done, Government finding the necessary Tools. In fact the Business seems to have been conducted much on the same footing as the Gun-carriage Agency at Cossipore, and other Military Establishments of the period, of a similar kind.

12. Since that period, the Military Agencies have undergone a great change.—The Superintendants receive a salary only, instead of a salary, and Commission, The Premises are the Property of Government, and the Tools supplied by them.—These Superintendants are

usually Officers in the Army, having of course their other allowances, together with the prospect of rising in Rank, and consequent emolument.

13. The Department of the *Master Builder* has likewise undergone various modifications, but the system on which it is at present carried on, appears to us complicated, and inconsistent. The *Master Builder* receives a trifling Personal salary, and certain allowances Amounting in the whole to Sa. Rs. 670 per *Mensem**, and he receives a Commission of 10 per Cent. on all Government works executed by him.

14. The Grant in this manner to the *Master Builder* of a monthly Salary, and the allowance to him of a monthly Establishment, we consider very objectionable in principle, since it may happen, that for months he will have no public works at all in hand, when he consequently is on the receipt of a Salary, without a return.—By a reference to the abstract of the Government Bills during the last 20 years, herewith transmitted it will be seen, that this was actually the case during the Official year 1822-23 during which, the *Master Builder* received as Salary, and Establishment Sa. Rs. 8,040, while the ten per Cent. Commission only yielded him for old, and new works 16,119..13..0; again should he be employed the whole year round, on work just sufficient to keep his authorized Establishment employed

* Master Builder, Sa. Rs.	250
1 European Carpenter ..	150
Writers.. .. .	60
Sircars.. .. .	60
Ground and Godown rent	150

Sa. Rs. 670

and consequently reap no advantage from the allowance, except his present Salary of Sicca Rupees 250 per Mensem, his charge of 10 per Cent. (half the amount invariably charged by other *Builders*,) together with this trifling Salary, can scarcely be considered a fair remuneration, for his skill and labour, and for the use of his Premises Tools, &c. &c. &c. Under the present system therefore, in no case can it be considered, that the *Master Builder's* duties, and remuneration, have that relation to each other, which ought to exist in all public Offices.

19. We are unaware of any good reason, why the *Master Builder* should not receive the same remuneration for his Labor, Skill, and Exertions, as all other *Builder's* do for their's.—It may be urged, that the quantity of Government Business, which is secured to the *Master Builder*, should enable him to do it at a less rate, than casual Jobs can be executed for, and to a certain extent this may be admitted, but it should be remembered that to enable him to do the occasional heavy business of Government, he must at all times maintain a large, and expensive Establishment, and incur very many and great expenses, which he would not do, merely as a *Private Builder*; and that the Government have in him a respectable, and intelligent Individual, always at their command, for references on various important subjects, connected with the Public Interests.—Thus during the war, up to the period of the discontinuance of the embarkation of Troops for Rangoon, and Arracan, Mr. Kyd gave his attendance to the embarkation Committee daily, for the purpose of furthering the Public Service, a matter certainly not relating to his

Contract with Government; And in like manner—in December last, he repaired to Edmonstone Island, for the purpose of reporting upon the feasibility of erecting a Bungalow there, which service, wholly unconnected with his Duties as *Master Builder*, he performed merely on the receipt of the usual Batta, which he received on proceeding down the River in the execution of those Duties. The quantity of Government work moreover is not uniform, and in cases where the required repairs are small in amount (which most frequently happens, Government, having but very few occasions to repair either large Vessels, or extensive damages.) The percentage does not cover the actual expenses of the *Master Builder*.—We beg to transmit a Sketch (the correctness of which may be depended upon) of the advantages derived to the *Master Builder*, both by his Commission, of 10 per Cent. and by his Salary for the last 20 years, from the Public works, intrusted to him which appear to us to be extremely small, and to be scarcely more than equivalent to the simple benefit, that has resulted from our having him as a Public Officer to consult with, on different points of a professional nature.

20. It will be seen that the average annual receipts of the *Master Builder*, on account of Commission, and Salary for the last twenty years, amount to Sa. Rs. 22,400 3..2..or 1866..10..11 per mensem.* The premises are the Property of Mr. Kyd, but we feel sure, that they could

* 10 per Cent new work, Sa. Rs.....	5,875..14..8½
10 per Cent old work.....	8,997.. 9..2½
Average Salary.....	7,256..11.. 3

12) 22,400.. 3.. 2

1,866..10..11

not be rented at a less rate than Sa. Rs. 1500 per mensem and the Establishment, European, and Native must be proportionately large. It is true that these Premises, and this Establishment, are also occupied with private Works, but they are especially devoted to those of the Government, and considered to be always at their command, and indeed through the Public Spirit of Mr. Kyd, they are to all intents, and purposes as available, to the Public Service, on all occasions, as if they were the actual property of the Company. Small, however, has been the remuneration of the *Master Builder*. During the last 20 twenty years it is evident, that even if the New Works, were continued to Mr. Kyd, there is little prospect of future years ever averaging the amount of the past, but by depriving Mr. Kyd of the New Works, and throwing them open to Competition, a measure by which the Government ensure their being executed at the most moderate terms, his remuneration will be reduced one third, as regards his per-centage. To make up for this, as well as from a principle of common equity, we recommend the abolition of the Salary, and Establishment, and the substitution of a percentage of 20 instead of 10 per cent.

21. Nor do we apprehend, that any expense will thereby accrue to Government, such as at least, as will not be counterbalanced from the New Works being executed on open competition, independent of the advantages to be derived practically in the execution of repairs. The average rate of 10 per cent Commission on the whole Works, for the last 20 years is Sa. Rs. 8997..3..8, per annum, and the present amount of annual Salary, and Establishment is Sa. Rs. 8,040 making total of Sa. Rs. 17037--3--8. Had Mr. Kyd during this period received

20 per cent, instead of 10 per cent, on the Old Works alone, without his Salary and Establishment, his receipts would have amounted to Sa. Rs. 17,995..0..4* a difference of about 80 rupees per mensem, in his favor, while the anomalous, and incongruous system of Salary, Establishment, and Commission would have been done away with, and the whole duties, conducted with simplicity, energy, and dispatch.

22. We have thus exhibited the result, which would have been produced by the System, we now recommend, on an average of the last 20 years, of course omitting the immediately previous year. The accounts of which are not yet made up, and we now place before your Lordship's view, the result of the averages of the last three years, during two of which, the Old Works, had in consequence of the war, been very large. The average yearly rate of Commission on Old Works, for the three years, from 1822, 23 to 24, 25 is Sicca Rupees 9,431..3..4. to which being added the Salary, and Establishment, viz. Sa. Rs. 8040. The whole amounts to Sa. Rs. 17471..3..4. while 20 per cent on the Old Works, would have yielded

* Per Annum Average rate of Commission on old work for 20 years as 10 per Cent.....	8,997.. 3.. 8
Annual Salary.....	8,040.. 0.. 0

Sa. Rs. 17,037.. 2.. 8

Average rate of Commission on old work at 20 per Cent.....	Sa. Rs. 17,995.. 0.. 4
--	------------------------

8,997 3 8 & 2

Amount difference..... 957..12.. 8

Monthly ditto..... 79..13.. 0

Sicca Rupees 18,862..6..8, making a difference of Sa. Rs. 1,391..3..4. or of Sa Rs. 115..14..8 per mensem.*

27. Nor can we close this address, without bearing testimony to the unwearied devotion, to the public service of Mr. Kyd, during the whole period of our official acquaintance with him: Mr. Kyd has been employed under Government, during the course of the last twenty-five years—twenty of which have passed by him, in the capacity of *Master Builder*, and five of that time, of assistant in the same office; And when we advert to his length of service, and the ample testimonials of approbation, which he has received from the Court of Directors, the Supreme Government, and this Board, and to the notoriety of the little advantage, that he has derived from the Government works, we trust that we shall not be considered as exceeding what is reasonable, if we venture to recommend, besides the augmentation of per-centage, as above suggested, that *Mr. Kyd* may as a special indulgence (to be considered exclusively personal to himself) be allowed to draw the allowance of 250 Rs. per mensem, under the new arrangements.

* Average of old work for the last 3 years at 10 per Cent.....	Sa. Rs. 9,431.. 3.. 4
Ditto ditto at 20 per Cent.....	18,862.. 6.. 8
Amount of Salary and 10 per Cent. on old works for the three years.....	17,471.. 3.. 4
	12) 1,391.. 3.. 4
	115..14.. 8

Extract of a LETTER from Government to the Marine Board, dated 20th July, 1826.

5. When the Hon'ble the Court of Directors sanctioned the revised Rules relative to the office of *Master Builder*, they intimated, that they should have preferred the Grant of a fixed salary, to that officer. There is also in the opinion of the Governor General in council an obvious objection to the principle of paying for any public work, by a commission, on the amount disbursed. It would be desirable consequently if practicable, on the present occasion of revision, to meet the Sentiments of the Honourable Court on the above point, and I am directed to request that you will state, whether in your Judgement, the sum of 2000 Rs. per mensem, would be an adequate salary for Mr. Kyd, instead of the Commission proposed by you, on his disbursements.

Extract of a LETTER from the Marine Board to Government, dated 7th August, 1826.

6. As regards the proposition of allowing the *Master Builder* a Salary of Sa. Rs. 2000 per mensem, in lieu of Commission, and other advantages, we find a difficulty under the existing System (we allude to the Dock being the private property of the Builder) in calculating with any degree of accuracy, what would be an equitable remuneration. In fact we have no fixed data on which to calculate the amount, other than taking an average of his work, for a certain number of years, and proportioning the salary, to the commission received.

7. But it is obvious, that this altho' it might secure to the *Master Builder* an equal amount of profit, during

a certain term of years, yet it would by no means secure his being remunerated, in proportion to his labor, and his skill—moreover we confess that we cannot but apprehend, that the principle of duty being placed in opposition to Interest, would by such a measure be introduced, since it would render the *Master Builder* altogether indifferent to the Execution of the Government work, and make him much more eager after that of private Individuals, than he is at present, or would be, under the System of commission.

8. In respect to the objection adverted to, in the 5th paragraph to the plan of paying for any public work by a Commission on the amount disbursed, we beg to observe first, that there is every possible check on the Disbursements, the prices of different Articles being fixed Quarterly, and the whole being subjected to the rigid scrutiny of the Surveyors, and our Board—But what we think should be especially considered is, that however advantageous a fixed salary, provided it was on a scale proportionate to the emolument derived from Commission, might be to the Individual, from the certainty of his receipt, whether he exerts himself duly or not, yet it will be found to hold out no prospect of equal advantage to the Government, who would lose the best security they can have for the Zealous exertion of his skill, Judgement, and ability, while the difficulty of substantiating such a degree of negligence, as would subject him to loss of situation, is too obvious to require notice.

We apprehend that no Individual would prefer a monthly salary however large, to the emoluments proportioned to his exertions, and this we have ascertained to be the feeling of the present *Master Builder*, who would not consider it at all worth his while to undertake

the Government business at the proposed salary, which tho' apparently large, would, when the Deductions consequent on his Expences, for his Premises, and Establishment are made, leave him, but a very small remuneration for his skill, and labour.

10 We should hope under all these circumstances that Government will not object to his being remunerated in the way that we have already proposed.

Extract of a LETTER from Government, to the Marine Board, dated the 21st September, 1826.

2d Under these circumstances the Right Hon'ble the Vice President in Council, is induced to revert to the change of system, in the *Master Builder's* Department and the mode of remuneration to that Officer, proposed by your Board, in your Letter of the 5th of July.

Extract of a LETTER from Government to the Marine Board, dated the 11th of October, 1827.

2d In consideration of the strong recommendation submitted in your former Letter dated 4th September, 1826, and repeated in the one now under acknowledgement, as well as with advertence to the frequent occasions, on which the *Master Builder* is required to give the aid of his professional advice and opinion on matters connected with the public Service. His Lordship in Council has been pleased to assign to Mr. Kyd a personal allowance of 250 rupees per mensem, to take effect from the 1st Proximo.

*FINANCE COMMITTEE'S REPORT
referred to at page 24.*

Para. 47. The question as to the best mode of providing for the execution of repairs, has undergone, minute investigation by us; The system of paying by a commission, upon the outlay, which now prevails, is certainly liable to objection, in as much as it renders it the interest of the builder, to make the repairs as expensive as possible, but it is the plan followed by the Merchants and Ships owners, and on the the whole, seems to be the the best, which the custom of the place, and circumstances, admit of.

48. There is clearly an advantage in having an Establishment at Command, to which Vessels may be sent as soon as they come up to town: To advertize for tenders on all occasions, where small repairs may be required, would be productive of great delay, and probably be attended with little, if any diminution of expence; and as in cases where serious injury has been sustained there is great difficulty in forming a judgment, as to the the extent of the requisite repair, until the Vessel has been put into Dock, and stripped, it is probably from this cause, that the Contract System has been so little practised. The Vessel once in dock and stripped, it is too late to enter into engagements with another Establishment; and where the probable expense of the undertaking is doubtful, it is natural to suppose that the terms would not likely be in favour of the owner.

49 Mr. Seppings the Surveyor, and Mr. Greenlaw the Secretary of the marine Board, have suggested the establishment of a Government Dock, but we are convinced that this would not prove an economical arrangement. The professional abilities of the present Master

Builder, and the very superior manner in which his work is executed, is acknowledged by every one. We have not found it proved that his charges are higher, than those of other Builders; Tho' as we shall presently notice more fully, the close inspection, and minute interference of the Survey Department, occasioning delay and expense, that would otherwise be avoided, the repair of the Government Vessels has cost more than that of private Ships, and under all the circumstances of the case, we think it will be best for Government, to continue to avail themselves of his services.

50 Should this course be resolved upon, it remains to be considered under what Superintendence, the work is to be executed, and the expense checked, on the part of Government. Formerly this duty was performed by the officers of the Master Attendant's Department, and the officers of the Vessel: but in March 1816 a separate Establishment was formed for the purpose, consisting of a Surveyor and an assistant, whose Salaries with the charges for the establishment, boats &c. attached to them, amount to Rs. 20,028, per annum*.

51 It seems to be more than doubtful, whether this change has been advantageous.—If it has introduced more appearance of System, and control, it has also, by deviding authority, and multiplying forms, interference, and correspondence, been attended with much unnecessary delay in the execution of repairs; and to cause delay

* Surveyor.....	1,000
Deputy ditto.. . . .	500
1 Clerk.....	50
2 Peons....	10
Stationery.....	25
2 Bauleah, No. 46 and 38.. . .	84

Total 1669

 20,028

is in fact to increase expence. Under the old plan, when the nature of the work to be done, had been ascertained, it was left to the master Builder, to prepare materials for the different parts, and to regulate the order, in which they were to be undertaken. At present no discretion is left to him in this respect, it rests with the Surveyor, not merely to point out, what is to be done daily, but also to prescribe the dimensions of the wood, that is to be used—nothing can be undertaken without his orders, and if any unforeseen difficulties arise in executing his directions; if it is found requisite to remove one or two feet of plank, more than he supposed to be necessary, the work must be delayed, until he can attend, and of course the services of the party of workmen allotted to it, are in the meantime lost.

52 The bad consequences of this system have been forcibly represented to us, in the course of our inquiries, by professional persons, whose opinion are entitled to great weight; but it seems hardly to require a knowledge of ship building, to understand, that when the Builder is acquainted with his business, it cannot be for the interest of Government, to prevent him from exercising his own judgement, and adopting his means to the end in view. In this line as in all others, much time and expense may be saved by a Systematic and judicious application of the means within reach, but this advantage is now lost, both to Government and the Builder. In the case for instance of the *Ernaad* which had been docked, and reported upon on the 25th December 1826, the instructions to Mr. Kyd were given at 24 different periods, extending to the end of April 1827. In point of professional knowledge Mr. Kyd is admitted by every one to be without a rival at this place, and it is

absurd that Government should deprive themselves of the benefit of his Science, and Experience, by making every act subject to the direction of another.

53 It has been said, that Mr. Kyd cannot always be in the Dock Yard, and that his people may in his absence execute the work badly, or add unnecessarily to its cost, by cutting up large wood, when small, and less expensive pieces, would answer equally well. But neither is the Surveyor always on the spot, he only attends occasionally, he directs what is to be done, and inspects it when finished ; and his assistant Superintends the execution. In point of fact therefore, so far as professional assistance is concerned, the Government only receive from him, what Mr. Kyd is paid to afford. There cannot be a doubt, that the mere business of seeing, that the materials are good, and adapted to the purpose, and that the Carpenters, and Coolies are not idle, might with safety be intrusted to the Commander, and Officers of the Vessel, as is the case in the Merchant Service, where the outlay must be beyond all comparison greater, and where the opinion of a Surveyor is considered necessary only to ascertain the extent of the damage sustained, and the sufficiency of the work, when completed. The Pilots we have seen all complain of the time lost in unnecessary forms, and references, before repairs can be commenced on, and the interference of the Surveyors while they are in progress.

54 There can be no difficulty in ascertaining the Market price of timber, and other Articles periodically, and the controlling authority therefore, will always have the means of preventing any excess of charge in that respect. We think then, that the present Establishment of Surveyors should cease, and that Government

should employ a person on the same terms, and in the same way as the Merchants—Mr. Shippings himself we may here remark, is permitted to be Surveyor to private Establishments, as well as to the Government.

55 But although all repairs or what is technically called, “old work” should be performed by the *Master Builder*, the construction of new Vessels, unless—built in the Company’s Yard at Bombay, and new Buoys, &c. Should be open to competition, and Mr. Kyd should not in such case have any preference. The present custom of allowing him to defer his tenders until he has ascertained the nature of those made by others is unfair, and is calculated to create jealousy and might prevent people from coming forward at all.*

LORD BENTINCK’S *Minute*.

From Statements furnished to me, by Mr. Scppings which have been circulated, it appears, that the charges for repairs executed by Mr. Kyd, from the month of November 1826, to March 1829, being a period of 29 months amount to Rupees 5,82,374—giving an average of Rupees 20,082 per mensem, and it appears to me, that we should have some control in the matter of so heavy an expenditure, beyond the builder’s own Statements of work done, and his Bills for the payment ; and I therefore entertain considerable doubts, whether the abolition of the office of Surveyor is expedient.

I cannot indeed conceive any system, so open to expence, and overcharge, as that of paying the Builder by a commission on his work—If the Government supplied the material, and the Builder was employed only to con-

* By no means the fact how the Committee Stumbled upon the absurdity I cannot conceive.

vert it, a commission on the work might with vigilant superintendence, prove economical, but such a plan is I believe impracticable—Much of what is connected with shipwright work, is capable of that strict delineation, that admits of contracts being entered into, though, as observed by the Committee, in cases where serious injury has been sustained, there is a difficulty in forming a judgment, as to the extent of the requisite repairs, until the Vessel shall have been put into Dock, and examined.—As much however of old work, as is capable of being distinctly specified, should be performed by contract, and I understand that the undermentioned descriptions of repairs, are easily delineated with sufficient precision to admit of Tenders being invited.

Charge for docking including every possible charge such as shoreing—wedging—pumping the dock out, rope, for hanging shores &c.

Hire of dock, for one or more springs	}	Including making and breaking Stages.
Stripping of old Copper, per foot		
Caulking bottom, Bends, do, do, do.		
Stripping off sheathing, do, do, do,		
Caulking keel seam, including shoring, do, do, do.		
Caulking tops, decks, and light work, do, do, do.		
New sheathing, various thicknesses described, including nailing, trimming complete, per foot		
Putting on new copper complete (Government finding the copper) per foot.		

Timber of kinds, which are in general use—price of Iron work according to kinds, stocking anchors, per Cwt., Boats of all kinds.

Masts—Spars, &c.

and this, system, if established, appears to require the supervision of an able, and experienced Surveyor.

The new work that is executed on account of Government, is also very considerable; and without a Surveyor, Government will be at the mercy of the parties contracting for it. The preparation of Drawings of such work, with the specifications of it, which are necessary to admit of its being put up to contract, is a duty which is performed by the Surveyor, who has moreover to examine, and report on all Ships, that may be tendered for freight, on the public account—and I confess that I do not understand, how the performance of these several duties is to be provided for, unless by keeping up the situation of Surveyor. It is possible, however, that the Establishment may not be required, to be maintained in its present footing, but this point will, of course, be considered by the Committee, when they again enter on an examination of this subject.

In the observations I have made, it may be proper to add, that no disparagement is intended to Mr. Kyd.—Far from it. Of that Gentleman's talents, I entertain a high opinion, and I have always understood, that he turns out substantial work, but we have to deal with Systems, not with individuals, and we have no security for Mr. Kyd, being either superior, to the generality of mankind, with regard to self interest, nor for our having his Services, beyond the average duration of life.

There may be matters in some of the foregoing Remarks, that are more properly cognizable by the controlling Marine Authorities, than the Finance Committee; but as they have mostly been alluded to by the Committee in their report, and as the points; under discussion may be enquired into, at the same time, I am desirous that they should all be referred, for the consideration, and report of the Body.

(Signed) W. C. BENTINCK.

October 28, 1829.

REPORT

OF

PROCEEDINGS

CONNECTED WITH

THE EAST INDIANS' PETITION

TO

Parliament.



BY THE EAST INDIAN COMMITTEE.

Calcutta :

PRINTED AT THE BAPTIST MISSION PRESS, CIRCULAR ROAD.


1829.

East Indian Committee.



Messrs. E. BARNFIELD*, W. BYRN, W. DACOSTA, P. D'MELLO, J. L. HEATLY†, A. INLACH, H. MARTINDELL, C. REED‡, J. W. RICKETTS, W. STURMER, and G. WODSWORTH.

SECRETARY,—Mr. J. W. RICKETTS‡.

 Messrs. W. BYRN, J. W. RICKETTS, and W. STURMER are duly authorized to sign, in an associated capacity, all receipts for donations to the EAST INDIANS' PETITION FUND ; which done, they are made over to Mr. W. DACOSTA for recovery of the sums subscribed. All collections are lodged in the Bank of Hindostan.

* Lately gone to England.

† These two Members have voluntarily seceded from the Committee.

‡ Mr. W. Sturmer has been appointed to officiate as Secretary, during Mr. Ricketts's absence on deputation to England.

REPORT OF PROCEEDINGS

CONNECTED WITH

The East Indians' Petition

TO

PARLIAMENT.



AT this interesting stage of our work, when the Agent formally deputed with the East Indians' Petition to Parliament, is about to take his departure for England, it behoves the East Indian Committee intrusted with the management of affairs, to lay before their constituents, and also before the numerous subscribers, whose kind liberality has helped so materially to swell the amount of the funds raised on this occasion, a brief review of their proceedings from the commencement up to the present period.

It will be in the recollection of some, that a private subscription was set on foot in the month of January 1822*, in order to defray the expenses incident to an appeal made to the King in Council by Mr. Charles Reed, in consequence of a certain decision of the Supreme Court in Calcutta, in a case in which he was individually concerned,—a decision by which a large class of East Indians were unequivocally adjudged as not coming under the denomination

* For an alphabetical list of subscribers, vide Appendix No. I. The whole amount raised on this occasion, has been appropriated to Mr. Reed's appeal case.

of "British subjects," in the strict technical sense of the term, and consequently as disqualified from participating in all the legal rights conferred upon that class of the community by the constitution of King's courts in India.

It was doubtless thought at the time, that a direct appeal to such a quarter was admirably calculated to accomplish a public object of great importance, by putting the question to the test of a formal decision by the highest judicial authority in England ; but, upon a reference to Messrs. Collett, Wimburn, and Collett, three eminent Solicitors in London, who were professionally engaged to transact this business, they gave it as their deliberate advice, among other things, that, if we sought a general redress of civil disabilities and grievances, we should at once bring our case of hardship in a tangible shape under the prominent notice of the British legislature.

Guided by this advice, Mr. Reed was led to convene a General Meeting at Mr. G. Wodsworth's house on the 18th November 1825, preparatory to further steps being taken in the matter ; and the result was, (Mr. W. Dacosta in the chair,) that a Committee was appointed, consisting of Messrs. W. Dacosta, J. L. Heatly, A. Inlach, H. Martindell, C. Reed, J. W. Ricketts, and G. Wodsworth, for the purpose of framing the draft of a Petition to Parliament, on the subject of our grievances. Mr. Ricketts, a Member of the Committee, was also appointed to officiate as their Secretary.

After much labour and research in collecting authentic materials for our purpose, the draft of a Petition was accordingly prepared by the Committee, and submitted to the consideration of a second Meeting convened at the place above mentioned, on the 11th February 1826. On this occasion, (Mr. W. Dacosta in the chair,) it was unanimously resolved, " that the document should lie at Mr. A.

Imlach's house, No. 40, Cossitollah, for the perusal and observations of all who might feel interested in the matter ; and that another Meeting should be held at that place, on the 28th of the same month, to take into consideration such observations as might be intermediately made." It was further resolved, that a fresh subscription should be raised, to meet the probable expense connected with the presentation of our Petition to Parliament*.

In accordance with the Resolution, as above quoted, a General Meeting was held at Mr. Imlach's house on the 28th February ; and the draft of the Petition having once more been read, accompanied by a few written observations from one or two quarters, (Mr. Imlach in the chair,) it was unanimously resolved, "that the document should be put into professional hands, for the purpose of undergoing such legal revision as might be necessary ; and that it should then be engrossed, signed, and sent to its proper destination."

The requisite preliminaries having been adjusted, the draft of the Petition was accordingly made over to a gentleman of eminence at the Calcutta bar†, on the 28th of the following month, accompanied by a fee of 40 Gold Mohurs, or Sa. Rs. 640 ; with whom it remained until the 21th May 1827. After repeated interviews and applications on the subject, it was at last put beyond all doubt, that his other professional avocations were such as to preclude the possibility of his allotting the necessary portion of time and attention to the matter ; and it was, upon due consideration, judged advisable to alter the arrangement, and transfer the document to other hands. Under these cir-

* For an alphabetical list of subscribers, vide Appendix No. II.

† Motives of delicacy forbid, under the circumstances of the case, the prominent mention of names, where *others* are concerned. It may perhaps be sufficient simply to state the facts ; but, so far as regards *themselves*, the Committee have felt it their duty to waive all scruples of this sort.

circumstances, another gentleman of the bar was chosen as a successor in the undertaking ; and the draft of the Petition, together with the fee of 40 Gold Mohurs, as returned by the former, was accordingly made over to him on the 28th of the same month.

Here the document remained until the 6th December 1828, when it was received back in a revised and modified form ; but the Committee, still anxious to secure for it all that might be gained by a co-operation of talents, deemed it expedient to call in the aid of a third gentleman, though not belonging to the legal profession, who very readily consented to afford his cordial assistance in the promotion of a public object of such importance, declining at the same time all idea of remuneration for his trouble. The draft of the Petition, as it came out of the hands of the gentleman just before alluded to, was accordingly handed over to him on the 10th January last ; and it was returned to the Committee, in altogether a new and improved garb, on the 24th of the following month.

The amended draft of the Petition having thus finally come back into their possession, a Meeting of the Committee, as then constituted, was held on the 28th of the same month ; at which, the document was read, discussed, and approved, and also authorized to be engrossed in duplicate for both Houses of Parliament. A vote of thanks was at the same time given to the gentleman last referred to, for his able assistance in revising and new-modelling the Petition ; and he was requested to accept of a McCabe's gold watch, bearing a suitable inscription upon it, with a gold chain, seal, and key, as a token of consideration for his trouble ; the receipt of which, he acknowledged in appropriate terms.

During the discussions of the Committee at their Meeting above adverted to, certain points both of law and fact,

as set forth in the Petition, were called in question ; and certain slight amendments were also proposed. To clear up these doubtful points, therefore, and to introduce these suggested amendments upon proper grounds, necessarily occupied a short space of time ; and the Petition, after all these unforeseen and perhaps unavoidable delays, was at length engrossed in duplicate, and sent to the Town Hall for signature on the 23d March last. It was also simultaneously ushered before the public in the several newspapers, eliciting remarks and observations of a different tendency from their respective Editors.

Such were the intermediate stages of that tedious and care-worn process, through which a document of so much importance had to pass ; and, whatever may be the final issue of their labours in a public cause, the Committee feel persuaded that this circumstance alone is, at least, sufficient to demonstrate their steady and deliberate perseverance in a work, the toils and anxieties of which were sustained only under a self-conscious rectitude of purpose, by which they were alike influenced and consoled. Equally potent, they conceive, is the same circumstance to carry conviction to every honest and reasonable mind, that no fair and legitimate means were left untried to secure every degree of efficiency in the accomplishment of the work intrusted to them.

The Petition, engrossed in duplicate, having been sent to the Town Hall, as above stated, it continued receiving daily accessions of signatures up to the 13th April; until which period, there was not the most distant idea of a deputation with it to England. Such an idea was now, for the first time, suggested to Mr. Ricketts, in the course of conversation, by one friendly to the objects sought to be attained by us ; but, how important and desirable soever in itself, he treated the suggestion at the moment as a matter quite beyond

the range of human probability. Upon more mature deliberation, however, he was brought to an opposite conclusion on the subject; and, waiving all personal considerations as regarded himself, he at once resolved to act up to his own convictions of imperious duty in a public cause.

As Secretary to the Committee, therefore, Mr. Ricketts scrupled not to submit to them a proposition to that effect, in the customary form of a circular, under date the 15th April, offering himself as a candidate for the arduous and responsible undertaking, on the lowest terms practicable; viz. the defrayment of his passage-money to and from England, and of his *bonâ fide* expenses during his stay there. Three Members* of the Committee entirely approved and concurred in the expediency of the measure, guaranteeing all their support towards the accomplishment of so desirable an object; whilst, on the other hand, another Member† doubted the competency of the Committee to act in the matter, proposing that a General Meeting might be convened for the purpose. A fifth Member,‡ though not exactly siding with the former, on the score of incompetency, yet virtually supported his proposition in regard to the convening of a General Meeting; observing that, “if such a Meeting sanctioned the measure, and if sufficient funds were raised, nothing further could be requisite.”

Here it may be proper to mention, that, in thus offering his services, Mr. Ricketts voluntarily stood pledged to the Committee to raise, by dint of personal exertions, the necessary funds on the occasion, so far as his own expenses went. Finding the majority of his colleagues, therefore, decidedly favourable to the proposed measure, whilst the

* Messrs. W. Dacosta, H. Martindell, and G. Wodsworth.

† Mr. J. L. Heatly.

‡ Mr. C. Reed.

minority were not positively against it, he lost no time in bestirring himself to redeem his pledge in that respect; and, whilst so engaged on the 16th April, he had an opportunity of ascertaining the sentiments of one or two gentlemen friendly to our cause; influenced by which, under the written opinions already expressed by Messrs. Heatly and Reed, and with the concurrence of the Committee, he issued a public notice, in his capacity of Secretary, for the convention of a General Meeting at the Town Hall, on the forenoon of the 20th of the same month.

About 300 persons being assembled at the appointed time and place, without any pre-concerted arrangement in any quarter, it was moved by Mr. F. D. Kellner, seconded by Mr. W. Byrn, and unanimously carried, that Mr. J. W. Ricketts be requested to take the chair. After an introductory address from the Chairman, in which he detailed at full length the nature and importance of the business which had brought them together on so interesting an occasion, followed by much discussion relative to the expediency of deputing an Agent with our Petition to England, the Resolutions below stated were unanimously passed and adopted in consecutive order.

1. " That, in order more effectually to promote the objects of our Petition to Parliament, this Meeting consider it to be a matter of first-rate importance, that some individual from among their own body be deputed to accompany the Petition to England, and that the individual selected for this purpose be authorized to place himself in communication with the General Committee of the Inhabitants of Calcutta; in order to seek such aid and assistance in the matter, as they may be able to afford.

2. " That Mr. J. W. Ricketts be chosen as our Agent for deputation to England on this occasion.

3. "That subscriptions be raised for the formation of a fund for promoting the great and important objects contemplated by us.

4. "That, under the present vacillancy of things in respect to a suitable name for their class, this Meeting consider it proper to recognize themselves as "East Indians,"—a designation which, as including the whole body to which they belong, they prefer above all others.

5. "That the hands of the Committee of East Indians, as now constituted, be strengthened by the accession of Messrs. E. Barnfield, Wale Byrn, P. D'Mello, and W. Sturmer; and that the Committee be authorized to appoint one of their own number to officiate as their Secretary, during the absence of Mr. Ricketts on deputation to England.

6. "That the thanks of this Meeting be given to the gentlemen of the Town Hall Committee, for the use of the Town Hall on this occasion.

7. "That the thanks of this Meeting be given to Mr. Ricketts, for his disinterested offer to proceed to England on deputation, and for his able conduct in the chair."

Relative to the expediency, or inexpediency, of deputing a special Agent with our Petition to England, about which so much discussion has taken place in the newspapers, but ending in a clear balance of public opinion in favour of the measure, it would be altogether out of place for the Committee, at this stage of affairs, to canvass the merits of the question. Suffice it to say, that the subject was not only openly brought forward and discussed, but also decided in the affirmative, at a General Meeting held at the Town Hall expressly for the purpose. The abstract question of a deputation with our Petition to England, was first put from the chair; and, having been fairly disposed of, after much discussion, it was next proposed by Mr. A. G.

Roussac, of the firm of Messrs. Walker, Roussac, and Co. and re-echoed from different parts of the room, that Mr. Ricketts be selected as our Agent on the occasion. This was carried unanimously, without a dissenting voice.

Thus much the Committee have felt it right to urge, in vindication of their proceedings against the groundless aspersions attempted to be cast upon them in a certain quarter. They allude to the criminatory letter published by two of their seceding colleagues in the Bengal Hurkaru and Chronicle of the 29th May last, the official reply from the Committee to which appeared in the same paper of the 1st June. But for this deliberate attempt to mar a good work, on the part of those from whom a totally different line of conduct was to have been expected, the Committee would not have thought it necessary to enter into such minuteness of detail about matters, for which, under ordinary circumstances, a more general form of statement would have sufficed.

It is surely one thing to advance and uphold a conscientious opinion on any public question; but it is quite another thing, when all arguments fail, to attempt to fix a wrong character to proceedings, the real merits of which need only to be brought to the test of a fair and open investigation to place them in their just position; and it most assuredly argues a consummate perversity of mind to endeavour to seek out a tinge of criminality in a plain case, where the materials for crimination are altogether wanting.

Before quitting this part of the subject, the Committee cannot abstain from the expression of their unfeigned regret, that, whilst engaged in a public cause, the bare mention of which is sufficient to enlist on its side the cordial support of every liberal-minded man, they should be placed under a painful necessity to defend themselves against the unmerited aspersions of those who, but for

their own unfriendly choice, might have co-operated with them, to this moment, in promoting the success of a good work.

After the foregoing observations, it only remains for the Committee to state what progress has been made in carrying into effect the Resolutions passed at the General Meeting of the 20th April last.

With reference to the concluding clause of the first Resolution passed on that occasion, the Committee think it sufficient to introduce the following reply from the Chairman of the Committee of the Inhabitants of Calcutta, to show the liberal spirit with which our wishes have been met, in regard to the co-operative aid of their Agent in England.

To J. W. RICKETTS, Esq.

Secretary to the East Indian Committee.

SIR,

I have been favoured with your letter of the 23d instant, and have had the pleasure of submitting it to the Committee of the Inhabitants of Calcutta ; by whom I am requested to furnish you with such letters to Mr. Crawford, on your departure for England, as shall ensure for you his co-operation in effecting the objects of the Petition with which you are to be intrusted.

I am, Sir, &c.

(Signed,)

J. PALMER,

Chairman.

Calcutta, }
30th April, 1829. }

The alphabetical list of subscribers, occupying a place in the Appendix,* will serve to show the encouraging degree of public liberality manifested by all classes of the community, in support of the funds necessary to be raised on this occasion. To place the hackneyed expression of thanks

* Vide No. 3.

by the side of such liberality, amounts to mere vapid compliment ; and yet (besides the noble luxury arising from the consciousness of having afforded gratuitous help in a good work,) this is all that the Committee, acting on behalf of the East Indian community, have to offer to those gentlemen, who, keeping pace, as it were, with the liberal and enlightened tone of the present age, have, with so much honour to themselves, and with no less benefit to a public cause, in which the majority of them can feel but a mere secondary interest, so completely put to the blush all feelings and sentiments which find a congenial home in none but minds of a contracted span.

A communication, in the form of a printed circular*, has been opened with the several stations in the Mofussil, with a view to engage their co-operation to the same end ; and a similar communication has been addressed to the East Indian community at Madras, Bombay, Penang, and Singapore. The result of this proceeding cannot, of course, now be ascertained ; but much cordial assistance may naturally be expected from those who are so deeply interested in the great and important objects at stake.

A General Abstract of Receipts and Disbursements up to this date, (first, with reference to the subscriptions raised in the year 1822, for Mr. Reed's appeal case ; and, secondly, with reference to the two series of subscriptions subsequently raised, in furtherance of the objects contemplated by our Petition to Parliament,) will be found in the Appendix† ; and a future Account will be rendered to each donor, or subscriber, at the final close of our work.

A word or two now remains to be said about the arrangements made, in regard to our Agent on deputation to England. A passage has been engaged for him in the ship *Andromache*, Captain R. L. Laws ; and, considering the

* Vide Appendix, No. 4. † Vide Nos. 5 and 6.

responsible public character with which Mr. Ricketts stands invested by the East Indian community, and the suitable degree of respectability necessary to be sustained on the occasion, (instead of leaving pecuniary matters to his discretion, by which a saving of expense might certainly have been effected, but perhaps at an unwarrantable sacrifice in a public point of view,) the Committee have, after due deliberation, authorized him to draw the sum of £500 per annum for his support in England, including all travelling charges, which is to commence from the date of his arrival there. Other necessary expenses of a contingent nature may possibly arise in the course of business, of which no idea can now be formed ; but which, they conceive, may, without hesitation, be left to his own prudent management on the spot. Every item of disbursement thus made, will of course duly appear in his Cash Accounts. To replenish our funds raised for these purposes by the contributions of public liberality, and thus to ensure a permanency to our undertaking, the Committee have set on foot the plan of monthly, quarterly, and annual subscriptions, in which they would fain hope to receive the hearty co-operation of all concerned.

Finally,—exercising the discretionary power confided to them by the Resolutions passed at the General Meeting of the 20th April last, the Committee have appointed Mr. W. Sturmer, one of their colleagues, to officiate as their Secretary during Mr. Ricketts's absence on deputation to England. And, now that our Agent is ready to take his departure from us, they cannot perhaps better conclude this their Report, than by imploring upon his future movements in a public cause of paramount importance, the special blessing of Him, by whose will “ kings reign, and princes decree justice.”

Calcutta,
10th July, 1829. }
}

P. S. Since writing the above, the Committee have received an intimation from Messrs. Heatly and Reed, by a letter addressed to one of their colleagues, that "they are about to give to their constituents their long-promised statement;" which renders it necessary for them to subjoin the whole of what appeared in the Bengal Hurkaru and Chronicle of the 29th May and 1st June last, as referred to at page 11 of this their Report, in order that their numerous supporters may see and judge for themselves.

13th July, 1829.

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

In 1822, a few Indo-Britons* exerted themselves in raising a subscription, in order to bring before the constituted authorities in England the grievous disabilities under which we labour. It was determined, in the first place, to prosecute an appeal to the King in Council, made by Mr. Charles Reed (one of our body) from a decision of the Supreme Court. The said appeal was made, in order to establish that we are natural-born British subjects; and consequently are entitled to enjoy the full benefits of the English laws and constitution.

2. In addition to prosecuting the said appeal, the subscribers determined that such other measures should be adopted, *especially including petitions to the legislature*, as should be deemed advisable by four Managers (Indo-Britons), viz. Willoughby Dacosta, Jacob Lambert Heatly, George Imlach (since dead), and Charles Reed, whom they appointed, and invested with full powers, to conduct whatever should be done on the occasion. *The money subscribed was made over to the said Managers, for prosecuting the measures in question.*

3. For prosecuting the said appeal, and in order to obtain information as to what other measures should be adopted, the said Managers (through Mr. George Wodsworth) appointed Messrs. Collett, Wimburn, and Collett, of London, to act on their behalf.

* Mr. Ricketts was not one.

The said gentlemen appear faithfully and intelligently to perform the trust confided to them: their conduct has given general satisfaction. Among other things, they recommended petitions to the British Legislature *to be prepared*.

4. In November 1825, the Managers called a Meeting of their constituents (Indo-Britons), in order to submit to their consideration the letters received from Messrs. Collett, Wimburn, and Collett. The Meeting adopted the recommendation of their said Agents in London; they appointed the three Managers present (the fourth was abroad), and four other Indo-Britons (including Mr. Ricketts as Secretary *) a Committee to prepare the draft of a petition, and *to lay it before the subscribers for approval*:—this was the Committee's sole duty. The trust of the Managers continued as theretofore. In the measures adopted up to that period, Mr. Ricketts was *no farther concerned than that he subscribed 50 Rupees*: the Managers neither asked nor obtained assistance from him.

5. A draft petition, in February 1826, was submitted to a very thinly attended Meeting. The few persons present resolved, that the said draft should be referred to a professional gentleman for revision. Eventually an entire new petition was prepared; consequently the resolution of November 1825, for the prepared petition to be submitted to the subscribers for approval, must be considered as remaining in force. Certainly Mr. Ricketts was not authorized to act as he has done: it was his duty to act according to the instructions of the Committee; whereas, he first acted according to his arbitrary will (it will appear in order to serve his private purposes at the expense of the subscribers); then he *deigned* to inform the Committee of what he had done †.

6. In getting a draft petition prepared by counsel, great and unexpected delay occurred. At length the draft of a petition was prepared; which draft, without being finally approved by a competent Committee, without being approved by, or even submitted to the subscribers, Mr. Ricketts caused to be engrossed on parchment, and to be placed in the Town Hall for signature.

* Mr. Ricketts asserts that he was appointed Secretary to the Committee, and also a Member thereof: the fact is thought to be otherwise; but, should Mr. Ricketts be correct in this respect, he cannot as a Member vote in his own behalf.

† One of the principal European gentlemen in Calcutta, on observing how Mr. Ricketts was proceeding, wrote: "Mr. Ricketts seems to be sole and aersal functionary, President, Secretary, Ambassador, and Financier."

7. The last mentioned extraordinary proceedings of Mr. Ricketts, have been followed up by measures yet more extraordinary, and also most unjust. It might have been proper in us immediately to have opposed Mr. Ricketts's proceedings; but wishing to prevent a division in our body, and desiring that nothing discreditable in the case of our petition should appear before the public, we endeavoured to induce Mr. Ricketts, and those associated with him, to abandon their unjust measure.

8. These our endeavours having failed, and advantage being taken of the time afforded by such our endeavours, to practise the most disreputable measures, in order to strengthen the previous unjust proceedings of Mr. Ricketts and his party;—we now consider it our duty publicly to oppose the measures of the said party. In determining to perform that duty, we are supported by the opinion of some of the most respectable of our countrymen, and also of Europeans. We intend to publish a statement of the case; and to call a Meeting of the Indo-Briton subscribers of 1822 and 1825, in order to determine what measures should be adopted in the present situation of our affairs.

9. Mr. Ricketts having unjustly obtained, and unjustly retaining, many important original papers of our case, it is probable that some days will elapse before the said statement be prepared, and consequently before the intended Meeting take place. We trust that, in the mean time, that is, until the particulars of the case be known, those who appointed us, and our countrymen in general, will not suffer themselves to be imposed on. We have been informed by different gentlemen, that they concluded Mr. Ricketts's late proceedings were authorized and *originated* by the Managers appointed in 1822; whereas, in fact, they have been adopted in direct opposition to our declared opinion: we consider the said proceedings most discreditable, most unjust, and most injurious to the interests of the subscribers of 1822, and of our countrymen in general.

10. If, from what is above stated, or from other considerations, you agree with us in thinking it desirable that our countrymen, and such others as are interested on the occasion, should know what has already been written in reply to Mr. Ricketts's publications under the signature of A. B. C. and of other letters of the alphabet, we trust that you will publish such letters on the subject as you have received up to this day.

11. We will not farther intrude ourselves on the public notice, until the abovementioned statement be prepared; and we greatly regret being driven thus to come forward.

TWO INDO-BRITONS, *Managers.*

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

We have perused, with equal surprise and regret, in the Bengal Hurkaru of yesterday, and in the Chronicle of this morning, a letter from Messrs. J. L. Heatly and C. Reed, styling themselves "Managers;" and, in that self-assumed character, casting aspersions upon the propriety of our past proceedings as Members of the East Indian Committee.

2. Without now entering into the question of their exclusive right to "Managership" on the occasion, and unnecessarily wasting our time in refuting assertions the most groundless and unjustifiable, we shall content ourselves with saying, that we are fully prepared to defend and justify, on a proper occasion, all our measures and proceedings against the machinations of a party. Conscious of the perfect rectitude of those measures and proceedings, we challenge a fair and open investigation; and nothing will give us greater satisfaction, than the opportunity likely to be afforded to us for this purpose at the General Meeting contemplated by Messrs. Heatly and Reed.

3. In the mean time, should individual subscribers either to the East Indians' Petition to Parliament, or to the funds, wish for any information or explanation on any particular point connected with our proceedings, we have only to add, that we have instructed our Secretary, Mr. Ricketts, to show all the necessary papers and documents bearing upon the case to any one desiring to see them.

We are, Sir, Your obdt. Servants,

E. BARNFIELD,
W. BYRN,
PAUL D'MELLO,
H. MARTINDELL,
JOHN W. RICKETTS,
W. STURMER,

} *Members of
the East Indian
Committee.*

Calcutta, 30th May, 1829.

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

As my name is prominently interspersed throughout the letter, under the signature of "**TWO INDO-BRITONS, Managers,**" which has appeared in the Bengal Hurkaru of this morning, the least you can do, in the way of common justice, is to give an early place in your columns to my reply, which will be as brief as the case may admit of.

It requires no depth of penetration to discover that the "**TWO INDO-BRITISH MANAGERS**" are Mr. Charles Reed and Mr. Jacob Lambert Heatly, whose singular proceedings have of late occasioned so much surprise to the East Indian community.

The Appeal to the King in Council, referred to by the writers, was one in which Mr. Reed had and still has, a deep personal interest at stake; and, without convening any Meeting on the subject, he, with two or three others, set about raising a private subscription in January 1822, in order to defray the law expenses connected with the Appeal. On this occasion, I for one subscribed and paid a voluntary donation of 50 Rs.; nor did I even so much as call in question the *self-constituted authority of the self-elected "Indo-British Managers,"* to levy the tax.

This, I confess, was all that I did, and all that I was content to do, in the matter. At the time the subscriptions in question were raised, it was generally thought that we were aiding in the promotion of a public cause, which involved the question of our rights as British subjects; but, on a reference to Messrs. Collett, Wimburn, and Collett, Solicitors in England, they advised us at once to petition the Legislature for the redress of our civil disabilities and grievances. As I was not one of the self-elected Managers, but "a mere subscriber" of 50 Rs., without the powers of legislation, I of course knew nothing about the true state of the case till I was made acquainted with it by Mr. Reed himself, who repeatedly called on me, and invited me to a General Meeting that he proposed to convene at Mr. Wodsworth's house, preparatory to further steps being taken in the matter. After much hesitation, (as I had previously had an opportunity of knowing Mr. Reed's waywardness in such matters,) I consented to attend the proposed Meeting, which was accordingly held at the place above mentioned on the 18th Nov. 1825.

Now I ask whose fault was it that, by the 2d Resolution passed on the occasion, (Mr. Willoughby Dacosta in the chair,) "Messrs. W. Dacosta, J. L. Heatly, A. Imlach, H. Martindell, C. Reed, J. W.

Ricketts, and G. Wodsworth" were appointed a Committee for drawing up a Petition to Parliament?

Again, I ask whose fault was it that, by the 4th Resolution passed on the occasion, "Mr. J. W. Ricketts," entirely unsolicited on his part, was requested to officiate as Secretary to the Committee?

After this, will the "Two INDO-BRITISH MANAGERS," insinuate any thing like Mr. Ricketts's having thrust himself, as it were, among them? No. They were very glad to avail themselves of Mr. Ricketts's services at the commencement of their work; but, now that the work is brought to a close, they can afford to dispense with those services! I thank them for so fair a specimen of "Indo-British" gratitude.

Thus originated my connection with the Committee appointed to frame a Petition to Parliament; nor had I any hand, directly or indirectly, in nominating any one Member of the Committee, who were respectively proposed by one gentleman and another at the Meeting.

The first draft of the Petition was prepared by me as Secretary to the Committee, and laid before a General Meeting held at Mr. Wodsworth's house on the 11th February 1826; on which occasion, it was resolved, "that the document should lie at Mr. A. Imlach's house, No. 40, Cossitollah, for the perusal and observations of all who might feel interested in the matter; and that a General Meeting should be held at that place on the 28th of the same month, to take into consideration such observations as might be intermediately made." After this, a second subscription was set on foot to meet the expenses connected with the presentation of our Petition to Parliament; and here again I was "a mere subscriber" of another voluntary donation of 32 rupees.

Agreeably to the foregoing Resolutions, a General Meeting was held at Mr. Imlach's house on the 28th February 1826; when, at my own suggestion, it was resolved that the Petition should be put into professional hands, to secure for it a legal accuracy in all its parts; and then engrossed, signed, and sent to its proper destination.

This was accordingly done; and the Petition was first put into one Barrister's hands, and then into another's, by which we encountered a delay of two years and eight months; and it, last of all, passed through the hands of another gentleman, whose name it is unnecessary here to mention. All this was done with the concurrence of the Committee, as documents in my possession will abundantly show.

This brings us from something like *ancient to modern* history ; and, therefore, to the sequel of the matter.

On the 26th February last, I issued a circular to the Committee, informing them that the revised draft of our Petition was ready, and convening a Meeting for the 28th of the same month ; and so anxious was I to obtain the benefit of a full Meeting on the occasion, that I concluded in these words : “ As this is likely to be the *last* Meeting with us about our Petition, it is particularly requested that all the Members will make it a point to attend on the occasion.”

At the Meeting in question, Mr. Reed made his appearance for five minutes, and then retired with an apology “ that he had other business to do ;” but our business was not to be neglected on this account ; and, notwithstanding the absence of one of the “ **INDO-BRITISH MANAGERS**,” the draft was read, discussed, and approved, and also authorized to be engrossed in duplicate for both Houses of Parliament.

This being accordingly done, the Petition thus engrossed was sent, with the concurrence of the Committee, to the Town Hall for signature on the 23d March last. Here it remained, receiving a daily accession of signatures, without any idea of a deputation from among the East Indian community to England, until the 13th April ; when it was suggested to me by a friend, in conversation, that such a thing would carry weight with it. I treated the suggestion, at the moment, as a matter not within the range of human probability ; but, upon a more deliberate view of it, I was brought to a different conclusion ; and, resolved to cast off every obstacle in my way as regards personal considerations, I made an offer of my services on the 15th of the same month, in a circular to the Committee, on the lowest terms practicable ; viz. the defrayment of my passage-money to and from England, and of my *bond fide* expenses whilst there. Three Members of the Committee* put their initials to the following words : “ Content ; and will willingly subscribe for so desirable an object, which, I presume, there will be no difficulty in accomplishing.” Mr. Heatly, one of the “ **INDO-BRITISH MANAGERS**,” doubted the competency of the Committee to act in such a matter, and proposed the convening of a General Meeting for the purpose. Mr. Reed, another of the “ **INDO-BRITISH MANAGERS**,” observed that “ the Committee of course has authority to carry into effect any measure which is determined by a General Meeting of our country-

* Messrs. Dacosta, Martindell, and Wodsworth.

men; and, if a General Meeting accept of Mr. Ricketts's offer, or if sufficient funds be subscribed to satisfy him, nothing further can be requisite." "*Nothing further can be requisite* ; and yet such is the consistency of this " **INDO-BRITISH MANAGER**," that he deems a second, and possibly a third, fourth, and fifth General Meeting necessary !

The General Meeting proposed by Mr. Heatly was accordingly convened, with the concurrence of the Committee, at the Town Hall, on Monday the 20th ultimo ; and, when the Notice convening the Meeting was circulated among the Committee, Mr. Heatly merely proposed the expunging of the word " General" from it. Mr. Reed gave out a false alarm, as it turned out, on the evening of the 19th, that the Meeting would be disallowed ; and he repeated the same alarm, as I understand, the next morning, which must have prevented the attendance of some. Mr. Reed himself did not attend, though Mr. Heatly did ; and not only so, but took a most active part in the proceedings of the day.

About 300 persons being assembled, without any pre-concerted plan in any quarter, Mr. F. D. Kellner moved, and Mr. W. Byrn seconded, that I should be requested to take the chair. Having accepted the call, I opened the business with an introductory address ; at the close of which, I put the abstract question relative to the propriety of a deputation to England, which underwent much discussion on both sides, and was unanimously decided in the affirmative. When I say *unanimously*, I of course except an amendment proposed by Mr. Heatly, and supported by a few others, which fell still-born to the ground. The first Resolution having been carried, the next question came before the Meeting, as to who should be deputed as Agent on the occasion. Mr. A. G. Roussac, of the firm of Walker, Roussac, and Co., a perfect stranger to me up to that moment, proposed me by name ; and other voices from different parts of the room echoed the same thing. Here, I confess, there was no opposition whatever ; and the question was carried, without a dissenting voice.

Two more propositions were submitted to the Meeting by Mr. Heatly ; one was, that a new Committee should be appointed ; and the other was, that our subscriptions should be confined to the East Indian community, to the utter exclusion of Europeans. This was unanimously rejected ; and one gentleman afterwards rather indignantly observed, " Is it any shame for us to apply for assistance to our fathers ?" In regard to the other point, an amendment was

suggested by different gentlemen in the Hall, that some new Members might be added to the old Committee; and it was proposed by one, and seconded by another, in consecutive order, that Messrs. E. Barnfield, W. Byrn, P. D'Mello, and W. Sturmer be appointed additional Members of the Committee. In all this, I had no hand whatever; except that I pleaded for Mr. Heatly's retention on the Committee, after he had left the room in a fit of moroseness.

Now, Mr. Editor, here is a statement of facts, which I can prove by the testimony either of documents, or of living witnesses; and all I can say upon the whole case, is that, if our proceedings at any stage of the business have been other than honest and straight-forward, then there is no individual, or body of men, in all the wide world, who can lay claim to the moral qualities of honesty and straight-forwardness. But I unequivocally deny the competency either of Mr. Reed, or of Mr. Heatly, to speak to this matter. Both of them were absent from Calcutta for more than one-third of the time between our first General Meeting at Mr. Wodsworth's house in November 1825, and the last one held at the Town Hall on the 20th April of this year: and, whilst in town, they neglected to attend our Committee Meetings; so that, as if just awake from a profound sleep, they would now seem to wish to undo all that has been done. I turn aside, therefore, from the testimony of these two "INDO-BRITISH MANAGERS;" and appeal, with pleasure and confidence, to the united testimony of Messrs. W. Dacosta, A. Imlach, now at Purneah, H. Martindell, and G. Wodsworth, if the latter will speak on such an occasion; for I regret to find that he appears to be under some restraint as Mr. Reed's Attorney. I would also appeal, with equal pleasure and confidence, to the united testimony of the additional Members elected at the General Meeting held at the Town Hall, on the 20th ultimo, so far as more recent proceedings are concerned.

In regard to my detaining papers from Mr. Reed and Mr. Heatly, my conduct in this respect admits of easy explanation. As to the former, Mr. Reed voluntarily requested me to discontinue sending any more papers to him. His request has been complied with to the very letter; for not a single paper have I troubled him with since. In regard to the latter, Mr. Heatly lately withdrew an original document of ours from a bundle of papers sent in circulation among the Committee; and we accordingly came to a resolution to send no more papers to him, unless he restored the one so irregular-

ly withheld by him. As he has declined to restore the paper, so have we adhered to our purpose on the other hand. There is another thing to be mentioned, in connection with this part of the subject. It is this. The Committee lately required certain papers from Mr. Wodsworth for a public purpose. When Mr. Reed came to know this, he forthwith issued an interdict to his Attorney; but, whilst he so acted, it was only a few days after that he had the modesty to apply to the Committee for certain papers which were required for some private purpose of his own. The result may be guessed at: but all this forms a ground of complaint with him; whether justly so, it is for others to decide.

The "TWO INDO-BRITISH MANAGERS" mention, that some one wrote to them, saying "Mr. Ricketts seems to be sole and universal functionary—President, Secretary, Ambassador, and Financier." I am no advocate for a plurality of offices; but I am a Member of the East Indian Committee, and acting as their Secretary; and am now deputed with the Petition to England. In regard to the *financial* part of the business, the following extract from the frontispiece to our Subscription-book will afford every explanation.

"Messrs. W. Byrn, J. W. Ricketts, and W. Sturmer are duly authorized to sign, in an associated capacity, all receipts for donations to the East Indians' Petition Fund; which done, they are to be made over to Mr. W. Dacosta for recovery of the sums subscribed. All collections are to be lodged in the Bank of Hindostan. At the final close of our work, a printed account of receipts and disbursements will be rendered to each donor or subscriber to the fund."

To conclude, I need scarcely say that I am not one of those who, for the paltry consideration of carrying a point, would tarnish the moral splendour of a good work by a crooked, "manœuvring" policy: and, if I were now called upon to account for the singular proceedings of the "TWO INDO-BRITISH MANAGERS" on this occasion, I should give it as my conscientious opinion that the opposition of one of them arises from our necessary withdrawal from his celebrated "Appeal case" to the King in Council, and of the other from his failure in all that he proposed at the late General Meeting held at the Town Hall; so that he at last left the room in the height of vexation, saying, "I will have nothing more to do with a Beggar's Petition."

I am, Sir, Your obedient Servant,

May 29, 1829.

JOHN W. RICKETTS.

P. S. After what I have now seen of the seductive plausibility with which a story, without a leg to stand on, may be manufactured and got up ; it will not at all surprise me to see myself brought in, one of these degenerate days, accused of "murder and highway robbery ;" time, place, and all the hackneyed atrocities of the deed being duly given.

APPENDIX.

No. I.

An Alphabetical List of Subscribers in the year 1822.

	<i>Sa. Rs.</i>		<i>Sa. Rs.</i>
Alexander, R.	... 300	Brought over,	4,824
Allan, R. W.	.. 50	Kerr, R.	... 50
Baillie, J.	... 20	Kerr, J.	... 50
*Bason, W.	... 200	Kerr, N.	... 20
Beauland, D.	... 100	Ledlie, J. P.	... 50
*Bellew, J. P.	... 25	Leslie, R.	... 100
*Bently, R. A.	... 50	Limond, R.	... 50
*Berkley, H. J. F.	.. 16	Mahert, R.	... 25
Breton, J.	... 200	Martindell, H.	... 100
Burrow, J.	... 25	*Martindell, C.	... 32
Chisholm, G. W.	... 50	*Martindell, C. S.	... 16
Chollet, J.	... 50	McGregor, Lieut. W.	... 40
*Conway, J. W. S.	... 20	Metcalfie, H. T.	... 16
Dacosta, W.	... 500	Morrell, J. H.	... 200
Davies, H.	... 100	†Palmer, H.	... 10
*Davis, W.	... 100	*Perroux, J.	... 100
DeCourcy, R. and A. Black,	... 600	*Pigou, T.	... 50
*Dove, J. M.	... 100	*Pigou, F.	... 50
*Driver, J.	... 100	*Pigou, J.	... 50
Forster, Lieut. H.	... 100	*Raban, J.	... 100
Forster, W. R.	... 25	Reed, C.	1,500
Forster, A.	... 25	Ricketts, J. W.	... 50
Frith, R.	... 300	*Sandford, E. M.	... 100
*Gardener, H. B.	... 16	Scott, C.	... 16
Glas, C.	... 100	Scott, T. B.	... 100
*Hair, W. F.	... 32	Stacey, W.	... 20
Harwood, J.	... 100	Sturmer, W.	... 20
*Hasleby, R.	... 100	Staunton, M. S.	... 200
*Hearsay, H. Y.	... 32	Swaine, W. A.	... 16
*Hearsay, W. H.	... 20	*Thomson, A.	... 16
*Hearsay, W. M.	... 16	Tottie, J.	... 50
*Hearsay, W. J.	... 16	Voyle, J.	... 100
*Hearsay, J. B.	... 16	Wattell, S.	... 25
Heatly, J. L.	... 200	*Wilson, P.	... 25
Imlach, A.	... 600	Wodsworth, G.	... 100
Imlach, G.	... 200		
Johnson, D.	... 100		8,271
Johnston, M.	... 100	Deduct amount of Sub-	
Jones, J. B.	... 100	scriptions unrealized,	1,408
Jones, C. J.	.. 20		
			<u>Sa. Rs. 6,863</u>

Carried over, 4,824

* Not paid.

† Unaccounted for by the Bill Sircar.

No. II.

An Alphabetical List of Subscribers in the year 1826.

	<i>Sa. Rs.</i>		<i>Sa. Rs.</i>
Bason, W.	... 30	Brought over,	1,781
Beanland, D.	... 32	*Leal, C. F.	... 8
Brae, T.	... 100	Leslie, R.	... 50
Brightman, E.	... 200	Lindstedt, C. W.	... 16
Brightman, H. G.	... 100	Martindell, H.	... 200
*Bruce, J. G. W.	... 16	Martindell, R.	... 16
Byrn, C. F.	... 10	Maseyk, J.	... 25
Byrn, Wale	... 32	McCarthy, R.	... 8
Byrn, W.	... 6	Moffat, J.	... 20
*Capes, E.	... 16	O'Neale, J.	... 10
Chalcraft, H.	... 16	Palmer, C.	... 50
Chalke, R.	... 8	Palmer, H.	... 5
Child, H. M.	... 32	Palmer, P.	... 32
Cowley, J.	... 5	Palmer, T.	... 32
Crahley, R. G.	... 10	Parmer, R.	... 6
Dacosta, W.	... 200	Parry, H.	... 8
*Davidson, A.	... 8	Payne, J. Jun.	... 10
Davis, W.	... 32	Perroux, A.	... 30
DeCourcy, R.	... 150	Perroux, J.	... 32
Dow, J. D.	... 16	Phillips, G.	... 10
*Emmer, J.	... 10	*Raban, J.	... 16
Forbes, R.	... 16	Reed, C.	... 200
Francis, C.	... 25	Ricketts, J. W.	... 32
Fraser, E.	... 50	Scott, T. B.	... 32
Fraser, W.	... 8	*Sinaes, J. F.	... 16
Frith, R.	... 100	Sinaes, W. D' M.	... 25
Gardener, H. B.	... 12	*Sinclair, W.	... 30
Good, R.	... 5	Sutherland, W. H.	... 16
Goodall, J.	... 6	Swaine, J. F.	... 10
Hall, W.	... 20	Swaine, T.	... 32
Heatly, J. L.	... 50	*Swaine, W. A.	... 30
Heberlet, A.	... 32	*Tottie, J.	... 50
*Henry, J.	... 32	Turnbull, P.	... 20
Higgins, T.	... 5	*Twidall, W.	... 10
Hill, J.	... 32	Valle, B.	... 40
Hodgkinson, J.	... 8	Voyle, J.	... 25
Hoff, J. J. L.	... 10	Wall, J.	... 10
Hollingberry, C. M.	... 32	Welsh, J.	... 25
Horn, J.	... 8	Wilson, H. C. R.	... 25
Imlach, A.	... 150	*Wodsworth, G.	... 100
Jebb, J. S.	... 20	*Wood, James	... 8
Johnston, M.	... 25	*Woollaston, W. M.	... 25
*Jones, J. B.	... 20		
Kellner, F. D.	... 16		3,126
Kerr, N.	... 30	Deduct amount of Sub-	
Kerr, R.	... 32	scriptions unrealized,	395
LaCombe, E. D.	... 8		

Carried over, 1,781

Sa. Rs. 2,731

* Not paid.

No. III.

An Alphabetical List of Subscribers in the year 1829.

	Rs.		Sa. Rs.
Adam, Dr. J.	... 20	Blackburn, J.	... 2
Adam, Rev. J.	... 10	Blechynden, J.	... 20
Adam, Rev. W.	... 100	Blood, T. S.	... 10
Agabeg and Co.	... 25	Blunt, W.	... 50
Aitkin, J. R.	... 50	Boilard, J. Jun.	... 16
Alexander, G.	... 16	Bolst, F.	... 8
Allan, G.	... 10	Bolst, J. C.	... 10
Allan, R. W.	... 50	Bolst, R.	... 8
Allardice, T.	... 16	Bolst, E. C.	... 8
Allhusen, F.	... 4	Bolst, W. H.	... 25
Allport, T.	... 20	Bonnaud, P.	... 5
Andrews, E.	... 5	Bonnaud, W.	... 10
Apcar, A. and G.	... 25	Botelho, A.	... 4
Archer, H.	... 10	Bowler, T.	... 20
Armstrong, F.	... 20	Brae, T.	... 200
Arnold, Major-General Sir J.		Breton, T.	... 10
Barrackpore,	... 100	Brietzeke, C. W.	... 20
Arson, A.	... 20	Brightman, H. G.	... 50
Arson, J.	... 10	Brown, Rev. J.	... 10
Athanass, J.	... 25	Bruce, Allan, and Co.	... 50
Bagley, J. T.	... 10	Bruce, J.	... 20
Bagram, G. P.	... 16	Bruce, W.	... 20
Bagshaw and Co.	... 50	Bryant, Lieut. Col. J.	... 16
Baillie, F.	... 8	Burke, Dr. W. A.	... 10
Baillie, N.	... 10	Burke, M. and E. R.	... 50
Baird, J.	... 16	Burrows, W.	... 2
Baker, C. W.	... 2	Bush, T.	... 20
Baker, Capt. H. C.	... 16	Byrn, C. F.	... 50
Bampton, W. J.	... 50	Byrn, W.	... 18
Barnett, W. (one guinea)	... 11	Caird, J.	... 16
Barnfield, E.	... 100	Cameron, Dr. W.	... 20
Bartlett, A.	... 50	Campbell, J.	... 5
Bartlett, J.	... 20	Campbell, N.	... 5
Bartlett, T.	... 50	Cantor, C. A.	... 10
Barwell, J. R.	... 25	Carey, J.	... 32
Barons, B. S.	... 20	Carey, Rev. Dr. W. Serampore,	16
Bason, T.	... 50	Carter, J. Mymensing,	... 40
Battine, Major W.	... 25	Casement, Colonel W.	... 50
Becher, G. Cuttack,	... 100	Castello, J.	... 20
Beck, W. W.	... 5	Castello, V.	... 10
Beeby, W. T.	... 50	Chalcraft, H.	... 10
Bell, W.	... 16	Chater, C. P.	... 4
Bell, J.	... 16	Chester, G.	... 50
Bell, J.	... 5	Child, H. M.	... 50
Berry, M.	... 1	Chill, W.	... 10
Betts, L.	... 10	Chill, G.	... 5
Biscoe, T. P. B.	... 32	Chisholm, G.	... 50
Bishonaut Mottylol,	... 10	Chollet, J. Jessore,	... 50
Bishonaut Mullick,	... 2	Christiana, C.	... 5
Black, J.	... 25	Clark, D.	... 16

	<i>Sa.</i>	<i>Rs.</i>		<i>Sa.</i>	<i>Rs.</i>
Clarke, T.	---	16	Durgeon, J. H.	---	50
Cockburn, M.	---	50	Dugat, P. L.	---	5
Collie, Captain J.	---	25	Duhan, W.	---	16
Collier and Bird,	---	32	Dumoulin, J.	---	16
Collins, J. W.	---	50	Duncan, W. J.	---	20
Conoylol Burraul,	---	10	Dwarkanauth Tagore,	---	100
Conway, Lt. W. Barrackpore,	---	10	Ede, J.	---	20
Cooke, C.	---	5	Edwards, W. R.	---	14
Cornelius, W.	---	4	Elias, W.	---	6
Cornelius, M.	---	6	Ellison, J.	---	2
Cornelius, A.	---	2	Ewan, C. Jun.	---	4
Cornelius, J. H.	---	4	Ewin, W.	---	16
Cornelius, J.	---	10	Farquhar, T.	---	10
Crabbe, J.	---	8	Favier, F.	---	32
Crane, F.	---	4	Fegredo, J.	---	5
Crane, G.	---	4	Feilde, J. T.	---	10
Crawfurd, A.	---	20	Ferguson, T.	---	32
Crocket, Dr. H.	---	16	Fergusson, F. J.	---	16
Crow, M.	---	5	Ferris, E. P.	---	8
Crump, J.	---	25	Ferris, J. R.	---	8
Crump, W.	---	250	Ferris, S. C.	---	8
Cullen, J.	---	100	Finlay, J.	---	10
Cunliffe, Lient. Col. R. H.	---	50	Fitzroy, Lt. F. W.	---	10
DaCosta, L. (1st.)	---	2	Flatman, J.	---	5
DaCosta, L. (2d.)	---	16	Fleming, R.	---	10
DaCosta, J. S.	---	16	Fleming, A.	---	12
Dashwood, R. H.	---	8	Fleury, J. J.	---	16
Dampier, W.	---	16	Forbes, R.	---	8
Davies, J.	---	5	Fordyce, J.	---	5
Dawes, W. T.	---	10	Foresty, W.	---	10
D'Abrue, J. L.	---	1	Forster, H.	---	20
D'Castro, A.	---	10	Fowles, W.	---	10
D'Castro, S.	---	25	Francis, C.	---	25
D'Cruz, J.	---	10	Fraser, E.	---	32
DeCruz, E.	---	10	Fraser, W.	---	10
D'Mello, P.	---	50	Fraser, A.	---	16
Denham, Captain J. J.	---	10	Friend, A.	---	5
D'Rozario, P. S.	---	20	Friend, A.	---	10
D'Rozario, M.	---	10	Friend, A.	---	50
D'Rozario, P. J.	---	5	Friend, A.	---	10
D'Rozario, W. C.	---	10	Frith, Dr. R.	---	50
D'Silva, C.	---	2	Galloway, G.	---	8
Dessa, J.	---	2	Garden, Capt. W.	---	20
Dias, J.	---	10	Gardener, G. R.	---	50
Dickson, W.	---	10	Gardener, H. B.	---	20
Dissent, P.	---	6	Garrett, Z.	---	2
Dixon, E.	---	20	Gilmore, J.	---	64
Dougal, J.	---	25	Gibson, R. G.	---	10
Douglass, J. R.	---	25	Gillanders, F. M.	---	20
Doveton, Ensign H. Barrack-	---		Glas, C.	---	20
pore,	---	32	Glass, C. T.	---	50
Dow, J. D.	---	25	Godfrey, G.	---	4
Dowling, J.	---	10	Gogerly, Rev. G.	---	10

	<i>Sa. Rs.</i>		<i>Sa. Rs.</i>
Gomes, L. F.	10	Homfray, P.	10
Gomes, P.	8	Horne, E. W.	10
Gomes, S. S.	2	Hovenden, Rev. W.	50
Gonsalves, A.	2	Howatson, J. R.	10
Gordon, A. Serampore,	5	Howatson, A.	4
Gordon, J.	25	Hudson, G. E.	16
Gordon, R.	16	Hughes, J.	16
Gourlay, J. B.	5	Huhn, J.	2
Gowan, Captain E. P.	10	Hull, J.	20
Graham, J.	20	Hypher, P.	5
Grant, Dr. J.	20	Imlach, Colonel H.	50
Gray, C.	2	Irvine, J.	3
Gray, E.	10	Jacob, R.	5
Gray, J.	5	Jacobs, J.	25
Gregory, T. (1st)	4	Jacobs C. B. M.	5
Gregory, T. (2d)	5	Jacob, C.	8
Greenwood, Rev. W.	20	Jacpeter, J. W.	4
Griff, B.	4	James, W. N.	10
Grindall, J.	2	Jaret, J.	10
Grose, A.	3	Jebb, J. S.	16
Grose, F.	5	Jebb, Mrs. F. J.	50
Guest, J. A.	8	Jenkins, Captain F.	10
H.	20	Jessop, G.	16
H. J.	2	Johannes, J. Chittagong,	10
H. G. E.	2	Johnson, J.	20
Habberly, R.	10	Johnson, W.	10
Hadow, C. S.	32	*Johnston, M.	40
Halliday, Dr. A.	50	Jones, C. J.	20
Hall, E.	20	Jones, F. W.	8
Hall, W.	20	Jore, J. O.	2
Han, T.	5	Kellner, F. D.	10
Hare, D.	20	Kerr, J.	50
Hare, G. W.	50	Kerr, C.	50
Harris, F.	200	Kerr, R.	52
Harris, J.	10	Kerr, N.	8
Hart, J.	10	Kirkpatrick, Rev. W.	4
Harvey, C.	5	L. J.	4
Harvey, F. E.	50	Lackersteen, J.	25
Heather, S. Serampore,	5	La Combe, T. D.	5
Hedger, W. N.	16	Lauchlin, J. M.	25
Henderson, Rev. J. R.	16	L. C. N.	8
Henry, J.	10	Lee, H. J.	2
Herbert, Captain J. D.	16	Lefever, C.	25
Higgins, T.	8	Leicester, H. G.	2
Hill, G.	20	Leslie, R.	50
Hill, Rev. J.	20	Leycester, W.	25
Hill, J.	64	Llewelyn, J.	25
Hodges, Lt. A.	16	Lopes, C. A.	8
Hodges, T. R.	10	Lorimer, J. A.	5
Hodgkinson, G. F.	5	Lowrie, E. W. (1st.)	4
Hoff, J. J. L.	10	Lowrie, E. W. (2d.)	2
Hollow, R.	4	Lyall, J. N.	50
Holmes, J.	50		

* Cancelled at his request.

	<i>Sa. Rs.</i>		<i>Sa. Rs.</i>
M. J.	1	Pallas, R.	5
M. W. H.	5	Panioty, E.	5
Macintyre and Co.	50	Parmer, R. and J.	20
Macdougall, Lt. J. P.	32	Paschoud, F.	50
Mackintosh and Co.	250	Paul, P. J.	25
Macleod, C.	2	Payne, J.	2
Macnaghten, W. H.	25	Payne, M.	2
Madge, Jas.	20	Pearce, W. H.	10
Madge, A. E.	16	Penney, J.	16
Madge, D. W.	10	Pereira, A.	5
Maling, J. Major	16	Pereira, F.	3
Manly, L.	5	Perroux, A.	8
Marques, P.	10	Perroux, C.	2
Marrige, J. B.	100	Perroux, J.	20
Marshall, C. J.	4	Phillips, A.	5
Martiu, C.	5	Phillips, G.	10
Martin, Dr. J. R.	25	Piffard, Rev. C.	25
Martin, M.	10	Pigou, J. Jessore,	50
Martindell, H.	100	Pine, G. H. Major-General,	
Maseyk, J. Jungypore,	100	Barrackpore,	50
Masters, W.	10	Pinto, F.	2
McCann, J. J.	16	Pittar and Co.	16
McCarthy, R.	4	Potter, S.	20
McKenzie, M.	10	Porteous, C.	10
Melville, W.	64	Prinsep, Captain T.	16
Mendes, A. J.	5	R. M.	1
Mendes, F.	250	Rammohun Roy,	32
Mercado, A.	25	Rattray, R. H.	25
Mercado, J.	5	Rebeiro, C.	5
Metcalf, Sir C. T. Bart.	1,000	Rebello, G.	16
Miller, J. H.	6	Rebello, R.	5
Mills, J.	10	Rees, M.	10
Moffat, J.	10	Rees, V.	10
Molloy, R.	20	Reichardt, Rev. T.	25
Moore, J.	50	Reid, P. Futteeaghur,	20
Moreiro, A.	4	Ricketts, T. Mymensing,	10
Morris, R. C.	10	Robertson, Jas.	32
Mortimer, J.	8	Robertson, A.	10
Nash, J.	5	Robertson, J.	5
Nicholson, Dr. S.	25	Robinson, D.	5
Nickels, J.	4	Robinson, Rev. W.	10
Nilmomy Mullick,	10	Rodrigues, D. F.	5
Nosky, E.	32	Rodrigues, F.	10
Nuthall, D.	2	Rodrigues, F. Sen.	2
Oakes, W. H.	50	Rodrigues, F. Jun.	4
Oehme, W. D.	10	Rodrigues, J.	2
Ogg, A.	5	Rodrigues, S. (1st.)	10
Ogilvy, Dr. A.	25	Rodrigues, S. (2d.)	3
Olliver, J. Berhampore,	50	Rodrigues, S. (3d.)	2
Orr, R.	10	Rogers, A.	10
Oxborough, T. P.	5	Ronald, R. M.	10
Oxborough, W.	10	Rostan, J.	16
Palmer and Co.	250	Roussac, A. G.	50
Palmer, H.	2	Roscoe, J.	8

	<i>Sa. Rs.</i>		<i>Sa. Rs.</i>
Rose, W. G. and J. Baillie,...	50	Swaine, W. J.	10
Rosewell, J.	10	Swaris, G. A.	2
Ross, A.	100	Swaris, J.	5
Ross, Capt. D.	25	Swiney, G. Colonel	16
Rostan, J.	16	Taylor, Major J.	25
Rumbold, Sir William, Bt.	20	Taylor, J.	8
Rustomjee Cowasjee,	25	Templeton, D.	5
Rutledge, T.	8	Thacker, W. and Co.	20
Sanders, W. J.	8	Thomson, D.	50
Sarkies, B. Serampore,	4	Thomson, R. S.	16
Saunders, J.	5	Thompson, W.	20
Saviel, J.	2	Tickell, Major R. Barrack-	
Scott, T. B.	50	pore,	5
Scott, C.	25	Todd, Lt. H.	25
Scott, W. H.	5	Tomlin and Co.	50
Sealy, C. A.	4	Turnbull, M. H.	50
Seppings, J. M.	25	Turnbull, P.	25
Sevestre, A. A.	2	Turnbull, H.	5
Sheppard, G.	10	Twentymen and Co.	16
Siddons, G. J.	32	Urquhart, J.	50
Silverton, J.	10	Uvedale, M.	25
Singer, S. P.	50	Vant Hart, J. N.	200
Sinaes, W. D. M.	10	Vander Beek, J.	8
Sinaes, F.	10	Vanderburg, J.	8
Sinclair, J. M.	5	Vaughan, Colonel J.	16
Smith, H. A.	50	Verboon, B. L.	8
Smith, C.	16	Vertannes, C. A.	5
Smith, P. S.	4	Vos, Dr. J. R.	16
Smith, H. M.	5	Voyle, J.	16
Smith, D.	4	Vrignon, G. F.	10
Smith, A. J.	5	W. J. L.	2
Smith, S. (1st.)	10	W. S. G.	8
Smith, S. (2d.)	16	Wales, R.	8
Smoult, W. H.	50	Wallis, W.	50
Smyth, T. W.	10	Wall, J.	10
Smyth's School, East Indian		Ward, Js. Sen. Beerbhoom,	26
Youth at T. W.	6	Ward, J.	25
Stacey, W.	10	Ward, J. B.	10
Stephens, C.	5	Warden, W.	16
Stevenson, Colonel R.	25	Watts, H. C.	25
Stirling, A.	50	Well-wisher, A	16
Strickland, R. S.	5	Well-wisher, A	16
Stuart, R.	4	Well-wisher, A	2
Stuart, J.	8	Wickins, J.	3
Sturmer, W.	50	Wilkinson, A.	2
Subscriptions collected at Gha-		Williams, J.	12
zeepore, as per annexed par-		Willis, J.	50
ticulars,	143	Wilson, P.	16
Subscriptions collected at		Wilson, T.	10
Hooghly, as per ditto,	332	Winston, E.	5
Sutherland, P.	25	Wittinbaker, M.	2
Sutherland, J.	8	Wood, R.	16
Swaine, T.	16	Wood, W.	10

	Sa.	Rs.		Sa.	Rs.
Wood, J.	---	2	Woollaston, H.	---	5
Wood, S.	---	4	Young, L.	---	5

Subscriptions received from Ghazee-pore.

	St.	Rs.		St.	Rs.
Blachford, J.	---	3	Higginson, H. A.	---	2
Blachford, J. M. Jun.	---	* 2	Hurley, C.	---	5
Blaney, P. P. Jun.	---	2	Julian, J.	---	12
Campier, J.	---	25	Morant, J.	---	2
Chatters, A.	---	10	Pengault, J. F.	---	5
Cockburn, G.	---	2	Scott, J.	---	16
Delpeiron, J. E.	---	32	Stewart, J.	---	5
D Rocha, P. C.	---	15	Turham, H.	---	5
Gascoyne, J.	---	5			

St. Rs. 148
or Sa. Rs. 143

Subscriptions received from Hooghly and Chinsurah.

	Sa.	Rs.		Sa.	Rs.
B. W. H.	---	32	Plusker, J.	---	4
Barber, B. Sen.	---	10	P. M. C. J. T.	---	6
Barber, P.	---	10	Revenue and Custom Officers		
Daniel,	---	10	at Hooghly,	---	50
D. E. R.	---	8	Ross, J. R. Sen.	---	30
D' Rozario, N. T.	---	5	Ross, J. R. Jun.	---	6
Godinho, R.	---	5	Ross, J. Robert	---	5
H. G.	---	16	Ross, J. Rowland	---	5
Hoff, J. C.	---	16	Ross, C. R.	---	5
Hoff, J. J.	---	2	T. N. B.	---	6
Leon, T.	---	5	Verboon, W. H.	---	10
Lobo, J.	---	2	Vogel, J.	---	4
M. P.	---	11	W. J.	---	5
Nicholas, J.	---	2	Watson, H.	---	6
Nickels, F.	---	16	Winn, J.	---	16
Pearson, Rev. J. D.	---	16	Z. J. V.	---	8

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An Alphabetical List of Monthly, Quarterly, and Annual Subscribers.

Andrews, J.	a. ---	6	Hall, W.	m. ---	2
Aldwell, A.	m. ---	4	Han, T.	m. ---	1
Baillie, N.	m. ---	1½	Hill, J.	a. ---	12
Barnfield, E.	a. ---	12	Hoff, J. J. T.	m. ---	1
Bartlett, T.	m. ---	2	Horne, E. W.	m. ---	1
Brown, J.	q. ---	3	Johnson, J.	m. ---	5
Byrn, C. F.	m. ---	2	Kellner, F. D.	m. ---	2
Byrn, Wale	m. ---	2	Madge, D. W.	m. ---	1
Byrn, William	m. ---	1	Madge, J. H.	m. ---	1
Chalcraft, H.	m. ---	1	Madge, James*	m. ---	2
D' Rozario, P. S.	m. ---	2	Madge, John	a. ---	12
Francis, C.	m. ---	2	Palmer, H.	m. ---	1
Galloway, G.	m. ---	1	Parmer, R.	m. ---	1
Gardiner, T. H.	m. ---	2	Sutherland, P.	a. ---	12
Goodall, J.	m. ---	1	Wall, J.	m. ---	1
Hall, E.	m. ---	2	Watson, Colonel A.	m. ---	5

* Discontinued.

No. IV.
(CIRCULAR.)

SIR,

The East Indian Committee have requested me to open a communication with you, in order to secure the aid of your co-operation in behalf of the great and important objects contemplated by the East Indians' Petition to Parliament; of which I have now the pleasure to send you a few printed copies, together with the subjoined copy of certain Resolutions passed at a General Meeting held at the Town Hall on the 20th April last.

2. The Committee conceive that it would be but a poor compliment to your best feelings, or to your sense of peculiar duty, if they were on this occasion to aim at any thing like argument to demonstrate the obligations entailed upon the East Indian community, at this interesting crisis, to take a voluntary part in a work, in which all are alike interested,—an interest which becomes doubly enhanced, whether with reference to our own public character in the scale of civilized life, or to the future prospects of our offspring, and of the rising generation among our body. They will, therefore, content themselves with stating, that the avowed object they have in view by this communication, is, to engage your best services as their Agent at for setting on foot a public subscription, in aid of the general fund raised in Calcutta, to meet all necessary expenses arising out of the work, in which they are now engaged.

3. The Committee are of opinion, that the pecuniary help proposed to be raised by your instrumentality, may very advantageously partake of a mixed description; one portion of it consisting of prompt donations payable at once, and another portion of it arising from monthly, quarterly, and annual subscriptions of such sums as may be voluntarily given. While the former must necessarily be exhausted after defraying our expenses within a certain range, the latter is more particularly intended as a means for the permanent replenishing of our financial resources.

4. This is precisely the plan, upon which the Committee have proceeded in Calcutta; and they are glad to be able to say, that the share of public liberality manifested among all classes of the community is so great, that they can enumerate in their alphabetical list of subscribers, some of the most respectable names both in and out of the service of Government. They mention this,—not with any idea to set up a standard for computing the amount of subscriptions that may eventually be raised, through your means, from the liberality of the European, East Indian, and Native classes of the community at and around your station,—but as affording a pleasing ground of encouragement, so far as regards the public estimation in which our present exertions are held by the majority of all classes of the Calcutta community.

5. There is only one other point, on which it may perhaps be necessary to say a few words. It is this. The Committee must ever regard themselves (and they hope to be so regarded by you) as now engaged in a public cause of paramount importance, from which, if their efforts prove successful, much good of no inferior order may be expected to flow among the whole mass of our countrymen dispersed all over India, whether resident in Calcutta, and at the different stations in the Mofussil, or at the Sister Presidencies, and at the circumjacent Islands; and it is on this broad ground alone, that they not only seek, but fondly anticipate, the most cordial co-operation of all concerned.

I am, Sir,

Your obedient servant,

No. V.

Subscriptions to support Mr. C. Reed's Appeal Case, per contra.

Dr.

1822.

Oct.	11.	To cash paid on account of Mr. J. L. Heatly's bill for printing charges, ...	80	0	0
Nov.	30.	To cash paid Messrs. Alexander & Co. for a set of bills, No. 211, on Messrs. Fletcher, Alexander, and Co. at 6 months' sight, in favour of Messrs. Collett, Wimburn, and Collett, for £500, at 1-11 per Sicca Rupee, ...	5,217	6	3
"		To cash paid Mr. G. Wodsworth for the Appeal Case to the King in Council, in part payment of his taxed bill, being the quota agreed on by the Committee, ...	1,194	10	0
		To Balance, ...	170	4	3

Sicca Rupees 6,662 4 6

Calcutta.
31st Dec. 1822. }

Amount of Subscriptions. (after deducting Sicca Rupees 8. 3. for discounting Hoondees received from the Mo-fussil.) ... Sa. Rs. 8,262 13 0
Interest from the Bank, ... 7 7 6

Sicca Rupees, 8,270 4 6

Cr.

1822.

Dec.	31.	By cash received on account of Subscriptions up to this date, ...	6,654	13	0
"		By Interest, ...	7	7	6

Sicca Rupees 6,662 4 6

(Signed) W. Dacosta,
A. Imlach, for G. Imlach,
Charles Reed,
J. L. Heatly.

Amount collected and accounted for above, ... 6,662 4 6
Amount collected since the 31st December 1822, ... 200 0 0
Outstandings, ... 1,408 0 0

Sicca Rupees, 8,270 4 6

No. VI.

Cash in Account Current with the Bank of Hindostan.

Dr.

		Cr.	
1826.			
Sept.	6. To the amount of Subscriptions realized up to this date, ...	2,413 0 0	
1827.			
April	30. To interest to this day, at 2 per cent. ...	30 0 11	11 8 0
May	24. To cash returned by T. E. M. Turton, Esq. ...	640 0 0	640 0 0
1828.			
April	30. To interest to this day, at 4 per cent. ...	73 5 1	16 0 0
Sept.	26. To the amount of further Subscriptions realized up to this date, ...	288 0 0	6 0 0
<hr/>			
		Sicca Rupees 3,474 6 0	
<hr/>			
		E. E.	Sicca Rupees 3,474 6 0
		(Signed) A. Imlach.	
<hr/>			
1826.			
Mar.	25. By cash paid to a native writer for making a fair copy of our Petition to be submitted to Mr. Turton, ...		11 8 0
April	1. By cash paid to T. E. M. Turton, Esq. for revising the Petition, ...		640 0 0
June	15. By cash paid to the Bill Sircar, Mackchunder Dey, on account of his wages, ...		16 0 0
"	22. By cash paid to Mr. J. L. Heatly for printing 150 copies of blank Receipts for Subscriptions, ...		6 0 0
July	18. By cash paid to the Bill Sircar, Mackchunder Dey, on account of his wages, ...		12 0 0
"	" By cash paid for a box for holding papers, ...		1 8 0
Dec.	16. By cash paid to the Bill Sircar, Mackchunder Dey, on account of his wages up to this date in full, ...		27 0 0
1828.			
May	28. By cash paid to T. Dickens, Esq. for revising our Petition, ...		640 0 0
Sept.	26. By balance in the Bank of Hindostan, ...		2,120 6 0
<hr/>			
		Sicca Rupees 3,474 6 0	
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Dr.

Cash in Account Current with the

1828.

Sept. 26. To balance this day in the Bank of Hindoostan,
as per last account, ... 2,120 6 0

1829.

April 30. To the amount of subscriptions of the present
year realized up to this date, ... 1,816 0 0

„ To interest to this day, at 4 per cent. ... 78 15 6

July 18. To the amount of further subscriptions realized
up to this date, ... 8,662 0 0

Carried over, Sa. Rs. 12,677 5 6

Bank of Hindostan, (continued.)

Cr.

1829.

March 6.	By cash paid to Messrs. Twentyman and Co. for a McCabe's gold watch, bearing a suitable inscription upon it, with a gold chain, seal, and key, presented to the Rev. W. Adam, for revising and new-modelling our Petition to Parliament,	600	0	0
May 5.	By cash paid to Messrs. S. Smith and Co. for printing 1,000 copies of the East Indians' Petition to Parliament,	50	0	0
„	By cash paid to Do. for printing 1,000 copies of the Resolutions passed at the General Meeting held at the Town Hall, on the 20th ultimo.	25	0	0
„	By cash paid to Do. for Advertisements in the Bengal Hurkaru and Chronicle,	11	13	0
„	By cash paid to Messrs. Rozario and Co. for Advertisements in the Weekly Miscellaneous Register,	3	0	0
6.	By cash paid to the Hircarrah, on account of his wages for the last nine days of April,	1	8	0
7.	By cash paid to Messrs. Rozario and Co. for Advertisements in the Weekly Miscellaneous Register,	1	8	0
14.	By cash paid to Rajkissore Saw and Radamudub Saw, for stationery purchased from them,	25	0	0
15.	By cash paid to Mr. T. B. Scott, for Advertisements in the India Gazette,	12	0	0
„	By cash paid to Do. for Advertisements in the India Gazette Public Advertiser,	1	6	0
„	By cash paid to Goluckchundaudy, for copying certain papers required by Mr. J. L. Heatly,	1	1	0
20.	By cash paid to Dr. J. Grant, for Advertisements in the Government Gazette,	11	4	0
„	By cash paid to Do. for Do.	3	12	0
„	By cash paid to Mr. M. McKenzie, for Advertisements in the Calcutta Exchange Gazette,	8	12	0
„	By cash paid to Mr. G. Pritchard, for Advertisements in the John Bull,	9	10	0
26.	By cash paid to Dr. J. Grant, for Advertisements in the Government Gazette,	22	14	0
30.	By cash paid to the General Post Office, for the postage of letters sent to the Mofussil, in April and May.	18	11	0
June 1.	By cash paid to Hurochunder Bhoose, Bill Sircar, on account of his wages, from the 22d April, to the 31st May last,	7	12	9
„	By cash paid to Mr. T. B. Scott, for Advertisements in the India Gazette Public Advertiser,	1	6	0
„	By cash paid to Do. for Do.	4	14	0
„	By cash paid to Do. for Do.	6	14	0
„	By cash paid to the Hircarrah, on account of his wages for May last, including 1 R. 6, As. for two tin cases for the Petition to Parliament,	6	6	0
9.	By cash paid to Captain R. L. Laws, of the Ship Andromache, for the passage-money of the Agent on deputation to England,	2,500	0	0

Dr.

Cash in Account Current with the

Brought over, Sa. Rs. 12,677 5 6

Sicca Rupees 12,677 5 6

Calcutta, }
July 18th, 1829. }

Bank of Hindostan, (continued.)

Cr.

		Brought over,	3,334	7	9
June	20.	By cash paid to Messrs. S. Smith and Co., for Advertisements in the Bengal Hurkaru and Chronicle,	...	7	4 0
	„	By cash paid to Do. for Do.,	...	2	4 0
	„	By cash paid to Mr. T. B. Scott, for Advertisements in the India Gazette,	...	11	0 0
	„	By cash paid to Mr. M. McKenzie, for Advertisements in the Calcutta Exchange Gazette,	...	1	8 0
	„	By cash paid to Do. for Do.,	...	5	10 0
	30.	By cash paid to the Baptist Mission Press, for printing a supply of blank receipts and circulars to the Mofussil,	...	42	0 0
	„	By cash paid to the General Post Office, for the postage of letters sent to the Mofussil in June,	...	53	11 0
July	3.	By cash paid to the Hircarrah, on account of his wages for June last, including 3 As. 6 P. for the cost of a Chatta,	...	5	3 6
	6.	By cash paid to Mr. L. Fernandes, on account of his salary as a writer for June last,	...	16	0 0
	13.	By cash paid to an extra Bill Sircar, for collecting subscriptions at Barrackpore and Serampore.	...	0	12 0
	14.	By cash paid to Hurreechunder Bhowe, Bill Sircar, on account of his wages for June last,	...	6	0 0
	„	By cash paid to Moodoosoodun Sein, Bill Sircar, on account of his wages from the 19th to the 30th of June last,	...	2	6 3
	17.	By cash paid to the Baptist Mission Press, for a copy of the Government Regulations, 8 vols. 4to. bound in calf, (from the commencement to 1828 inclusive,) and other Law Publications,	...	264	0 0
	18.	By cash paid to Ramconoy Roy and Co., for engraving a name plate, with 500 visiting cards for the Agent on deputation to England,	...	16	0 0
	„	By cash paid to the General Post Office, for the postage of letters sent to the Mofussil up to this date of the present month,	...	2	15 0
	„	By balance this day in the Bank of Hindostan,	8,906	4	0
		Sicca Rupees,	12,677	5	6

E. E.

JOHN W. RICKETTS,

Sec. to the East Indian Committee.

A SERIES OF LETTERS,

And other Matter,

REGARDING A CERTAIN SCHEME FOR FORMING A

“COMMERCIAL AND PATRIOTIC ASSOCIATION,”

AVOWEDLY FOR THE PUBLIC GOOD OF

THE EAST INDIAN COMMUNITY;

WITH

A DEDICATION TO THE HONORABLE THE COURT OF DIRECTORS FOR THE AFFAIRS OF THE UNITED COMPANY OF MERCHANTS OF ENGLAND TRADING TO THE EAST INDIES.



By JOHN W. RICKETTS.



Duty is duty all over the world. India, then, (no less than England,) expects every man to do his duty.

N. B. Any profit accruing from the sale of this work, will be made over to the Parental Academic Institution.

Calcutta:

PRINTED FOR AND SOLD BY THE AUTHOR.

1828.

DEDICATION.

To the Honorable the Court of Directors for the Affairs of the United Company of Merchants of England trading to the East Indies.

HONORABLE SIRs,

The present age may be regarded, perhaps beyond any other, as an age of false praise and adulation, which, like unhallowed incense, are lavishly offered at the shrine of what is called human greatness. Hence “dedication” is but another name for “flattery;” and he who dedicates his work to another, is presumed to have already made up his mind to flatter such a personage, whoever he be, even though it involve a glaring prostitution of truth, and a downright sacrifice of principle.

Feelingly alive, as I am, to the certain evil tendency of such a perversion of things, where truth is absolutely dethroned to make room for its opposite, it may perhaps be almost superfluous for me to make the avowal, *that*, so far as in me lies, I am resolved to depart from the beaten track on this occasion, and to address your Honorable Court with all that openness of candour and freedom, which a perfect consciousness of the integrity of my purpose can alone inspire.

If your Honorable Court are influenced, (as it is to be presumed you are,) by any real feeling of regard for the public welfare of India, so often exultingly called “the brightest gem in the British crown,” I am persuaded that your Honorable Court will not grudge a patient and candid perusal of the following pages now dedicated to you, which embrace the consideration of several points of interest connected with the important case of East Indians. These are a numerous class, daily

and hourly springing up in this country, who, though professing the same religious creed with your Honorable Court, educated in the same language and principles, apparelled in the same dress, influenced by the same feelings and desires, and susceptible of the same flow of exultation or ebb of disappointment, are nevertheless, by the stern operation of a standing edict on the statute-books of the India House, positively debarred from all participation in the responsible service of the State in India; and this, too, without any moral fault or crime of their own.

On a reference to my address at a public Meeting, held at the Exchange Rooms on the 21st ultimo, as inserted at page 58 of this pamphlet, your Honorable Court will perceive, that allusion was made by me, on that occasion, to the truly philanthropic design of the Bengal Military Orphan Society, as originally projected by the late Colonel William Kirkpatrick, whose memory still lives, and will long

live, in the grateful recollection of those who now are, or who may hereafter be, the interesting objects of that noble Institution ; and your Honorable Court will further see, that, influenced by a simple obedience to the sacred call of truth, I scrupled not to lay the fault of things, as they are, where it ought to be laid, at the door of the India House in Leadenhall street.

A philosophical mind, however, not content with the specious appearance of externals, and looking beyond the mere flimsy surface of things, naturally seeks for a more satisfactory solution of the real, or probable cause of public measures. Hence, the harsh measure of our marked exclusion from the service of the State in India, (as if we were public felons, or traitors, doomed to the penalty of public degradation,) may, perhaps, with propriety be traced to one or other, if not both of the two following causes; viz. first, *an apprehended loss of private patronage at*

the India House, which must have followed the adoption of Colonel Kirkpatrick's plan, inasmuch as it would have secured a regular influx of youths born in India, and expressly sent to England to be educated for a destination in the military branch of the East India Company's service; and, secondly, *an apprehended political danger*, arising from the prominent public employment of a class, who, whilst they are "the sons of native Indians," as the official phrase runs, might perhaps be supposed to cherish a maternal predilection for the soil of India, with apparent danger to the safety and stability of British interests.

In regard to the *latter* hypothesis, the plausibility of its alleged foundation in fact has long since been exploded before the irresistible force of truth-wrought conviction impressed upon every honest and upright mind; and the man who would, at this time of day, venture to declare an opinion to the contrary, would assuredly incur

the risk of being thought a fit subject for bedlam. As to the *former*, the mere private ground assumed for such a line of public conduct, as that above referred to, is perhaps still plausible enough, if self be a right principle of action, to the utter exclusion of a paramount regard for the general welfare.

But for the exclusive system of policy heretofore observed towards East Indians, much valuable service had been already rendered to the State by those, who now literally operate as a dead weight upon the wheels of its cumbrous machinery ; and much room for reasonable and well-grounded complaint had been consequently obviated. But for the *reto* put by your Honorable Court upon Colonel Kirkpatrick's laudable design, too, I for one might now have been a Major, or a Colonel, in the service of the East India Company.

So far as I am personally concerned, however, I will not just now go out of my way to contend with your Honorable

Court, about the public stigma thus causelessly fixed upon me, in common with my numerous countrymen around me. On the contrary, I have abundant reason to congratulate myself on the exact position I occupy at this moment in my own sphere of life, and which enables me to render the tribute of my individual exertions to a public cause requiring much energy and perseverance. Had it been otherwise, or, in other words, had Colonel Kirkpatrick's plan been sanctioned and carried into effect, the case with me would, in all human probability, have been altogether different. Dazzled, perhaps, with the splendour of an epaulet, or rather of a brace of epaulets, and elated with the brilliancy of a sash and a sword, I might have been totally lost to every useful and important purpose under the sun; and, so far as regarded the effects of my personal exertions, adieu the Parental Academic Institution, which was formed on the 1st March 1823; and adieu, also, the Com-

mercial and Patriotic Association, which was formed on the 31st ultimo.

Circumstanced as we are, and realizing the true position in which we stand, in this the very land of our birth, we feel it incumbent upon us, as men, and as Christians, to seek the proper advancement of our rising children, and of our coming posterity, by the energetic use of every legitimate means which Providence has put into our hands, and to aim at the steady promotion of public good for that class of the community, to which we more particularly belong.

Such are the views and feelings, which, I am free to confess, have more or less influenced me in my past career for the attainment of those great public ends, before which self becomes, as it were, annihilated; and I take this first and, possibly, last opportunity to assure your Honorable Court, once for all, that, whatever of *seeming* disrespect there may be upon the face of this dedication, I deem it my

most positive Christian duty to submit, with all due deference, to “ the powers that be,” but without at the same time compromising that sacred principle of moral dignity, which ought ever to attach to a rational, an intelligent, and an immortal being.

I have the honor to be,

Honorable Sirs,

Your obedient Servant,

JOHN W. RICKETTS.

Calcutta,
15th February, 1828. }

PREFACE.



THE object of the letters contained in the following pages, is of the last importance to the temporal welfare and prospects of the rising generation in India, as proposing to open for them a new source of honest, industrious, useful, and independent livelihood,—a desideratum, of which their immediate progenitors, as a distinct class, cannot boast even to this day.

The question has often been started by one and another, “What is to be done for our rising children?” In the silence of sober contemplation, I have also repeatedly thought to myself, “Who will shew us any good” in this matter? Are our progeny destined to pine in want, and to languish out a wretched existence in this the very land of their birth?” For my part, I must confess that it has always puzzled me to find out a proper solution for questions like these; and never have I been able, (till now, I hope,) to come to any satisfactory conclusion

on the point ; fully convinced, as I am, that no Government or State upon earth can ever furnish a never-failing source of competent livelihood to a whole “ nation of clerks,” as we have sometimes been called. The present age is but an age of infancy, in regard to East Indians ; and hence, in our own day, the desk and the counting-house may provide employment for a limited number of hands, perhaps almost equal to the demand ; but it may be asked, what is to become of our successors in life, when, (as they must inevitably do in the natural course of things,) they increase in numbers to an incalculable extent ? Here lies the main difficulty ; and it is for others to determine, how far I have succeeded in pointing out a way, in which such a difficulty may be gradually, but effectually overcome.

The operation of the scheme now proposed, if once carried into effect, would go a considerable way to reverse the scene. Instead of leaning upon Government, as upon a broken reed, for the means of subsistence, we should, on the contrary, be enabled rather to contribute towards their support, in the way of revenue, by the payment of duties and

taxes levied on our prosperity ; thus realizing, in one sense, the consolation of the doctrine, “ It is more blessed to give than to receive.”

When I first took up my pen to write the letter No. 1, addressed to the Editor of the Bengal Hurkaru and Chronicle, I had not the most distant idea that it would have issued in an attempt to compass any useful or important end, as it has so happily done. Nor did I ever contemplate, till this morning, the publication, in the separate form of a pamphlet, of the letters herein referred to ; but it has occurred to me, that some good may result from thus transplanting them from the pages of a diurnal, and placing them in a more convenient shape, and in one collected point of view, before those who are so deeply interested in the subject.

THE AUTHOR.

11th January, 1828.

P. S. Since the publication of the first edition of the letters referred to in the foregoing preface, some further discussion has been

called forth in the public prints, regarding the scheme broached in those letters ; and I have thought it best to preserve a faithful record of the whole, in the form of a pamphlet, dedicated to the Indian authorities in England.

6th February, 1828.

THIRD LETTERS,

ADDRESSED TO THE

Editor of the Bengal Hurkaru and Chronicle.



LETTER I.

SIR,

It is a pleasing spectacle to the philanthropist to see “the march of intellect,” and the rapid progress of education among the East Indian community, who, (to the no small disgrace of the age in which we live,) labour under many civil and political disabilities in this the very land of their birth.

In my opinion, Sir, education will work out a gradual, but an effectual cure for all these monstrous evils. Let parents and guardians but avail themselves of the solid advantages now provided for their children and wards in this respect; and, when these again come to act their part on the public theatre of life, they will have acquired, it is to be expected, such a vigorous tone of moral feeling and principle, as to secure the proper discharge of their own obligations towards their offspring, and command the esteem and respect of all honest, reasonable, and intelligent men.

Thus the work of improvement and reformation will go on among East Indians, as they increase in numbers, intelligence, and moral respectability, until the current of

public opinion shall turn decidedly in their favour, and banish for ever the prevalence of unjust and illiberal prejudice, which takes shelter in a semi-barbarous and less enlightened age.

If I remember right, the Marquess of Wellesley once told his youthful collegiate hearers on a certain public occasion, that they were to consider themselves as the *nobility* of India, destined to take an active part in the administration of public affairs in this country. Be it so; but to the East Indians, I would say, that even much greater things are expected from them. As to *them*, they are to rear their offspring for the glorious work of rational emancipation from those evils, under which they themselves groan; and this is to be done by a steady and well-regulated process of education, carried on from year to year, and from age to age.

I am,

Sir,

Your obedient Servant,

A LOVER OF RIGHT, AND

8th January, 1828.

A HATER OF WRONG.



LETTER II.

Sir,

It is high time that some just notions should be inculcated upon the minds of East Indians, regarding the true position in which they stand, and the course to be pursued by them for elevating their offspring above the narrow

point to which they themselves are lamentably reduced, without any moral fault or crime of their own.

In my letter of yesterday, which you have so readily inserted in the Hurkaru of this morning, I took occasion to point out the solid advantages of education now provided for the youths belonging to the East Indian community ; and this is unquestionably the true road to moral elevation of principle, character, and conduct. But, Sir, a great deal must yet depend upon a right direction to be given to our young men in their future path of life. As things are, parents in general would seem to think that, by an irrevocable law of nature, they and their offspring are born and designed for nothing else but *Keraneships* in the City of Palaces. Hence, as soon as a lad excels in the mere mechanical art of penmanship, whatever may be the strength of his genius, or the natural bias of his mind, he is hastily dragged out of school, thrust into an office, nailed down to a desk, and made to toil in hard and unprofitable servitude, without any prospect of rising beyond a certain limited point in the sphere in which he is thus engaged.

Now this is altogether an erroneous plan of conduct, both as it respects the premature removal of a boy from school, and the placing him inevitably, and as a matter of course, in a sphere of life where the opening blossoms of genius and talent are doomed to droop, wither, and die.

Youth is doubtless the proper season for laying a solid foundation, whereon to build a future superstructure ; and, where circumstances will admit of it, a young

man should never be removed from school, till he has fully completed his education. This is a point too often sadly overlooked by parents and guardians, to the cost of our youths in after life. In regard to the other particular above mentioned, it is true that every occupation in life must have its complement of hands ; and a certain number must consequently be required for filling the situation of clerks, registers, book-keepers, and so forth ; but I ask, whether this will always supply a never-failing source of employment to East Indians ? Their numbers are daily increasing ; and it cannot be expected that situations in public offices, constituted as they are on the sordid principle of self, will be created according to the extent of the increasing demand for them. It will follow, then, that the clerical market, as it may be called, will be so completely glutted in the course of a short lapse of time, that either the talents and qualifications of East Indians must be rejected and thrown back upon themselves as an unsaleable commodity, or they must find a new market for them in another sphere of life beyond the precincts of Calcutta.

Now let us look at such a fact full in the face, as one that must be realized by our coming posterity. And what is to be done, to meet the impending evil ? It is for parents and guardians themselves to take the matter into their most serious consideration, and chalk out a new and untried path for those whose welfare and interest are committed to their trust. There is a trite saying, that “ necessity is the mother of invention.” Such a necessity now surely exists, in regard to the future prospects of East In-

dians; and I think that the road is plain before us. The occupation of the soil is our natural and undoubted birth-right, of which nothing can despoil us. The country is large and wide, and there is room enough and to spare. Let us turn our attention to the *Mofussil*, and effectually introduce the work of colonization in the interior. Of our children, let us make them indigo planters, landholders, farmers, &c. and betake ourselves to such other resources as local circumstances may suggest. Let us plant schools around us for the education of the natives, and infuse into their minds those sound principles of learning, morality, and religion, of which they remain altogether destitute to this day, though living under a professedly Christian Government. All this, and more, may be done by forming small Associations for the purpose, by dozens and scores; and thus let a goodly number of us walk out of Calcutta, in solemn silence, as unworthy of us.

I could say a great deal more upon the subject; but let this suffice as a mere outline to be filled up by the serious and sober reflection of those whom it so immediately concerns.

I am,

Sir,

Your obedient Servant,

A LOVER OF RIGHT, AND

A HATER OF WRONG.

9th January, 1828.

LETTER III.

SIR,

Now for another, and, perhaps, a final communication, close at the heels of my last, which was addressed to you under date the 9th instant. After the hint thrown out towards the conclusion of that letter, it may be of use to lay a few ideas together of a practical tendency, calculated to bring about an Association of the nature therein proposed. And here is something in a more substantial shape for the serious consideration of East Indians, and others, who may be found willing to engage in a new and untried path of life.

Let us suppose, for instance, (taking things on the lowest scale,) that we can find twenty individuals of enterprise, who are disposed to embark in the projected undertaking. If so, let these form a social compact among themselves, to be called, for reasons of obvious import, "The Commercial and Patriotic Association." Each member of this Association might then contribute, say 5,000 rupees*, which will at once raise a fund of one lac for the commencement of operations. This fund being duly lodged in the *most perfect and unsuspected security*, let the Association depute one or two managing partners from among their own number, to obtain a footing in some commercial landed concern in the interior, (whether it be a sugar, indigo, cotton, or other manufactory.) I would recommend the selection of two, in preference to one, as they would be helpful to each other in the management of the concern, and one

* Should this sum be objected to as large, an easy remedy presents itself. Where a whole share cannot be taken by a single individual, let two or more persons club together in the purchase of it. It would be obviously desirable, that each share should be of a respectable amount; and this object would be gained by the expedient proposed.

would supply the place of the other, in case of sickness, or other unavoidable circumstance. It will not be necessary for any of the rest of the members of the Association to quit Calcutta, in order to promote the success of the undertaking. They would have to remain at head-quarters, just where they were, exercising a general power of control over every branch of the concern. The managing partners, besides participating in their individual share of the profits accruing from the business, might be allowed a fixed monthly salary for their services, just sufficient to afford them a comfortable maintenance. The entire funds of the concern would of course be exclusively under the control, and at the disposal, of the Association. For this and other purposes, a Corresponding Member and Secretary might be chosen, to conduct all the business and correspondence that may be carried on between the Association in Calcutta, and the managing partners in the *Mofussil*. The accounts of the concern might be made up monthly, for the information of the Association ; and a fair and an equal dividend, in the way of profit and loss, might take place, at the close of each year, among the share-holders. Should a large measure of prosperity ultimately attend our operations, of which the prospect is bright, the concern might be enlarged to any extent, either by the original members taking one or more shares themselves in it, or by inviting others to join them*, and the business of the

* Should the number of members become so great as to render it unwieldy for the transaction of business, they might choose a Committee of Management from among themselves, to conduct all the affairs of the Association. At the same time, an additional number of managing partners might be advantageously deputed to the *Mofussil*, according to the increased magnitude of the undertaking.

concern might thus be profitably extended to other branches of commerce, embracing even shipping and foreign adventures. Whenever this was the case, the Association might **very creditably** turn their attention to the work of education among the natives in the district immediately around their station, and to the general improvement of the resources of the country. A great deal might be done in this way, and perhaps at a comparatively trifling sacrifice of expense. *Sacrifice*, do I say? No. It is a sacred duty we owe the land of our birth, to do all the good we can, in the way of improvement and civilization all around us, in our day and generation; and to the natives themselves, this would be but a fair compensation for the contribution of their labour towards the success of our affairs.

To my scheme of a "Commercial and Patriotic Association," the principal objection made, as far as I can learn, is, that it will require *good managing partners*, or, in other words, men of tried character and judgment, experience and enterprize. Granted; but who ever said otherwise, so as to render this fundamental point a matter of debate? The same objection may be made, and the same qualifications may be stated as wanted for every other similar undertaking in the world, so that this leaves us just where we were. To this objection, however, (if it can be so called,) I would say, Get precisely such men as you want for the purpose, and the thing is done. To compare small things with great, why it is after all only "24 gentlemen in Leadenhall Street," as they have been

called, who conduct all the weighty affairs of this vast eastern empire ; and surely it is not too much to expect, that twenty, or perhaps a larger number of gentlemen, interspersed through different streets in Calcutta, may manage a commercial undertaking of the kind proposed ; for it will be the duty of the Association themselves to elect the managing partners. It is they who are to appropriate the funds, and, in a word, do all that is necessary from first to last. I would then say, Make the trial, put your energies to the test, and the result will speak for itself.

For my part, I think it would be a libel on us to suppose, that, among the East Indian community, there are not to be found men of substantial character and qualifications enough for such a work as is now contemplated. When it was first proposed to establish a public school for our rising children and coming posterity, just five years ago, (terminating, as it afterwards did, in the establishment of the Parental Academic Institution,) precisely similar objections were started by different individuals, as if nothing could be done ; but, now that we have experience on our side, let the result of our operations since the 1st March 1823, bear testimony to the tangible reality of what was once deemed merely visionary and chimerical. He who cannot grapple with, and overcome the first obstacles and difficulties incident to a new undertaking, I admit, is not the man for accomplishing any great or important object ; but why should we come to such a melancholy conclusion, and at once consign a whole class to public ignominy and shame ? I would fain hope better things of us.

Should these my honest endeavours prove of any efficacy with those who are to take the whole matter into consideration, I would propose that a private consultation be held, at an appointed time and place, among such as are fully inclined to enter upon the undertaking, in order that they may form themselves into an Association, frame a code of rules for the management of their affairs, and take such other steps as may be necessary to the full consummation of all their wishes.

When I penned my first letter, I had no idea of sitting down to a second, and then to a third; but my present communication resolves itself into a downright commercial scheme, requiring perhaps an appropriate change of signature; the former, "A Lover of Right, and a Hater of Wrong," being calculated only to pourtray the warmth of feeling, under which I then wrote; but, Sir, it is time to cool upon a commercial subject, and a sober coolness of judgment and conduct is more especially required of commercial men. With your leave, then, Mr. Editor, I will now subscribe myself,

A MERE PROJECTOR.

10th January, 1828.

P. S. Though the project contained in this letter emanates from an East Indian, (since it must emanate from some quarter or other,) it may as well be clearly stated, once for all, that it is intended to be open to all, whether Europeans or Natives, and that "none are excluded" from the Association, "but those who do themselves exclude."

Editorial Remarks in the Bengal Hurkaru and Chronicle of the 15th January, 1828.

We wish all manner of success to our correspondent "A MERE PROJECTOR's" scheme. His intentions are highly honorable and philanthropic; but still we doubt if the plan devised is calculated to produce the beneficial effects contemplated. It is, in so far as we understand it, to establish a joint stock Association, composed of twenty, fifty, a hundred or more share-holders, and with the joint capital to carry on some extensive joint concern in the Mofussil, as an example to East Indians of what may be done in the interior, and by way of exciting them to turn their steps to the paths of industry in that quarter, instead of confining themselves to the narrow sphere of Calcutta. "A MERE PROJECTOR" adverts to the Honorable Company, as an example of what may be effected by a joint stock Association. No illustration could be more unfortunate; for it is a known and admitted fact, that the Company, notwithstanding great individual skill and zeal have been employed, have all along traded at a loss, and that their large remittances of produce from this country, are not, as in the natural course of trade, the mere returns of their exports, but are paid for from the revenues of the country, of which they still hold sovereignty. In fact, the appropriation of this revenue to this purpose, is one of the state necessities for the relief of which the people are taxed. Taxation is resorted to, to produce a surplus of revenue above expenditure, and remittances of produce are made to enable the Company to pay demands at home. It

matters not that the produce sells at a loss, so it sells and yields. If it does not yield enough for the wants to be supplied, more must be had ; and, if not by greater prudence and economy in speculations, taxation must be called into play to fill the void. Notwithstanding this union of political power and trading monopoly, however, the Company are still public debtors to a very large amount. Surely, then, there is in their example little encouragement to the formation of joint stock Associations for trading or manufacturing ; and we believe the opinion, out of their own body, is fast becoming universal, that their interest and their dignity, (if they are to retain their power at all,) would both be consulted better by a dissolution of the anomalous alliance of the business of Traders with the office of Rulers.

If the East Indians are desirous of trying such an experiment as that proposed, we think we can point out a much better mode of doing it. Let them unite, and subscribe a capital, to be lent at a fair rate of interest to any two or three individuals possessing the requisite qualifications of integrity, experience, intelligence, and activity ; and let that capital be secured upon the property purchased, and the interest regularly paid. Two or more of the subscribers may act as trustees for the whole body of the mortgagees, and be empowered to call on the mortgagers annually or half-yearly for their accounts. By this means, if, after a fair trial, it should be found that the experiment does not succeed, (we see no reason why it should not,) the property may be sold, and the proceeds divided be-

fore any serious loss has been sustained. By this mode, it appears to us that every purpose contemplated by our correspondent will be answered, without the cumbrous machinery of a joint stock Association, which only impedes the operations of commerce, weakens the stimulus to individual exertion, and leads inevitably to a disregard of that economy so essential to success in all matters of trade*.

We understand perfectly, that "A MERE PROJECTOR" would require the individuals, who were to conduct the concern purchased by the Association, to be share-holders, perhaps of 5,000 Rupees each, out of a lakh or two lakhs: but it requires little experience of human nature to perceive, that the stimulus of such a consideration to economy and activity would be utterly insignificant, compared to that which would be in constant operation, if the same parties were actual proprietors, having to bear the whole loss resulting from any imprudence and extravagance, or to enjoy the whole profit derivable from economy, activity, and good management. A loss of ten per cent. upon the capital, say of two lakhs, would, in the latter case, add to their debt forty thousand Rupees; it would be an

* I did not regard this suggestion to be of sufficient importance to need a reply. To me, it appeared that it would be like grappling with a mere shadow; since the *feasibility* of what was proposed by the Editor, is quite out of the question. Where, for instance, should we find persons willing to come forward, to raise a capital "to be lent, at a fair rate of interest, to any two or three individuals, and to be secured upon the property purchased?" Besides, after all, this would be but a mere encouragement of *private enterprise*, and not the accomplishment of a *public object* I had in view. This object was, and still is, by our united exertions, to raise the public character of an increasing class, kept at a low ebb by the pressure of difficulties and disabilities, which are so unjustly heaped upon them by the exclusive system of policy observed by their rulers.—*Note by the Author.*

instant loss of twenty thousand, and they would be thrown back a year in paying the interest of their borrowed capital. Now, in the scheme proposed by our correspondent, the ten per cent. would be a loss to each perhaps of 500 rupees, and the risk of ruin remote ; for it would be felt so lightly, that there would be a constant temptation to go on with the concern, though not prosperous, till the whole capital was sunk. In short, it is impossible that joint stock Associations can ever be conducted with the economy, activity, and skill necessary to success.

We have another suggestion to offer, which may be worthy of our correspondent's attention. He may possibly recollect, that, about a year or two ago, proposals from a Society in England were circulated to the agency houses here, relative to the encouragement of an improved process of culture and manufacture of our sugars, to enable them to compete with the West Indians in quality and price, and drive the produce of slave labour out of the market. We have not time to refer now ; but, if our memory deceive us not, the circular also adverted to an improvement in the process of cleaning cotton. For the promotion of these objects, it was proposed to lend out capital, for the purpose of erecting sugar mills, &c. the loan to be secured on the property ; but we believe, that it was required of the agents here to advance money on account of the London Society on *del credere*, which they were unwilling to do. Our correspondent, however, may ascertain the particulars by reference to any agency house ; and it might be found advantageous for the Asso-

cation he proposes to establish, to put itself in communication with the Society at home; and perhaps the union of their efforts and means might, in time, realize the philanthropic objects both have in view. The London Society would aid them with funds at moderate interest possibly, on such security as they could command; and it would send out persons to instruct them in erecting and working sugar mills, and in the improved process of cleaning cotton. A reference to this body would cause delay; but the objects in view cannot be effectually promoted by any ill-concocted, hastily adopted scheme. They require, to insure success, mature deliberation, and the acquisition of the fullest information on every point. An improvement in the manufacture of our sugars, seems to us the first object to which attention should be turned. It is probable, that the additional duties will be removed ere long; but, even then, we must compete in quality with the clayed sugars of the West Indies, in order to extend our exports of that staple. Now we have not yet the means of making the attempt. We want the machinery, and people to teach us the use of it; for both which, we must apply at home; so that references to England are indispensable, before any thing practical can be done. We have not time at present to dwell further on this subject. We just throw out these hints, for the consideration of our correspondent, and those who are about to associate with him for the purpose he has in view. There is one other observation, however, to which we would call his attention. It is this, that we think the East Indians,

as well as aborigines, should avoid at all times any measure which may serve to continue a line of demarcation, and perpetuate an invidious distinction between them and the Europeans. To effect any important object for the welfare of British India, the means and the energies of subjects of all classes should be united. We observe, indeed, that Europeans are not excluded from the Association; and our precaution, therefore, as far as they are concerned, is rather a general rule, than an objection applying to the particular case, although the circumstance of a proposal to associate for the purpose of promoting the elevation of East Indians does, in a manner, mark out a distinction, which we hope ere long will cease to exist.

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

I am quite pleased with the drift of your editorial remarks in this morning's paper, regarding the scheme of a "Commercial and Patriotic Association," as proposed by me. They are encouraging, and likely to have a good effect; but I have just one word to say about the comparison you have drawn between my projected Association and the East India Company.

When I adverted to this commercial body, I did not mean to hold them up as an example for our imitation; but my object was merely to shew how great an undertaking is capable of being carried on by an association of "24 gentlemen in Leadenhall-street," so far as regards the management of the weighty affairs of India.

You will allow, however, that, in regard to the pecuniary bearing of the question, there is all the difference in the world between such an Association as we contemplate, and the East India Company. As to the latter, they are *sure* of their dividend, whether their affairs prosper, or not. To them, it is like “a bird in the hand,” which “is worth two in the bush.” Hence the marked apathy and indifference that prevail among the general body of proprietors of East India stock, regarding their own concerns in this country. Not so, however, with the former. They must absolutely and literally *work out* a dividend for themselves, or be great losers by the undertaking. This alone would be calculated to operate as a powerful stimulus to extraordinary activity and exertion among the managing partners in the Mofussil, and to a corresponding vigilance of control on the part of the Association at head-quarters.

I am, Sir, your obedient Servant,

A MERE PROJECTOR.

15th January, 1828.

Editorial Remarks in the Bengal Hurkaru and Chronicle of the 18th January, 1828.

The author of the letters under the signature of “A LOVER OF RIGHT, AND A HATER OF WRONG,” and “A MERE PROJECTOR,” has, we observe, got them up in a pamphlet, with a short preface prefixed to them, which we republish. On the proposition stated in these letters, we have already expressed our opinion; but we shall be glad to find that it attracts attention. We have pointed out

what we conceive to be an improvement on the writer's suggestion ; and, although we perfectly understand the difference between an Association like that proposed, and a body like the Honorable Company, we still think that, in the way we have suggested alone, the intended experiment is likely to succeed. It is to be regretted unquestionably, that the East Indians should still confine themselves to the Presidencies, as they now do. But who can wonder at it, when they look to the cause, the state of the law ? In Calcutta, an East Indian enjoys the protection of British law ; but, in the Mofussil, with all the intellectual superiority of a European, and animated, perhaps, by truly English sentiments, to what indignities is he not liable ? We have heard, even here, of an instance of a respectable Eurasian (East Indian) female, who lived in the 24 Pergunnahs, being compelled by brutal *Chowkeydars* to walk in the sun, in the hot season, a distance of three miles, to the Magistrate's *kutcheree* ; a piece of brutality, however, which, we are well assured, the worthy Magistrate did not fail to punish. But, until there is some change in the law, the East Indians in the Mofussil must be liable to the Mofussil courts ; and it is not surprising, therefore, that they should prefer the Presidencies, where they enjoy the same protection and privileges as their European brethren in other respects, and are not liable to be transmitted from the chosen place of their abode.

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

In republishing the preface to my pamphlet in your valuable journal of this morning, you have very properly brought forward another circumstance arising out of the subject, which deserves to be considered ; and, lest this should operate, in the minds of some, as an objection to the accomplishment of my scheme of a “ Commercial and Patriotic Association,” I will endeavour to meet it in a few words.

That the arm of British law, such as it is, thrown round the life and property of the subject within the limits of Calcutta, is a blessing, however dearly purchased, none will have the hardihood to deny ; and that the *Mofussil* courts are far behind in this respect, owing to the perpetual exercise of corrupt influence among the native officers of those courts, equally baffles all contradiction. But this, Sir, need not operate in such a way, as to amount to a serious obstacle in our case. If the three Jewish worthies, strong in the consciousness of their own integrity, could venture into “ the burning fiery furnace,” surely East Indians may safely venture into the *Mofussil*, for the laudable purpose of earning an honest livelihood for themselves ; and, in spite of all the known venality and corruption of *Mofussil* courts, every honest man may surely calculate upon safety and protection in the pursuit of his lawful calling.

On this subject, let us at once refer “ to the law and to the testimony” for a correct definition of the ends of ma-

gisterial authority. See Romans, 13th chapter, 3d verse :
 “For rulers are not a terror to good works, but to the evil.
 Wilt thou, then, not be afraid of the power? Do that
 which is good, and thou shalt have praise of the same.”

Here we see, that, so far from oppression or degradation, “praise” will be the just desert of East Indians in their new circumstances, whilst peaceably engaged in a course of honest industry. Besides, this very industry would obviously tend to swell the amount of the Government revenues, the only source whence all their vast expenditure is to be found. It would, therefore, involve no less a positive breach of fealty to Government, than an act of wanton injustice to the subject, if ever any of their judicial servants were guilty of any thing like oppression or maltreatment towards East Indians in the circumstances above supposed, or even lent themselves to such a work of mischief plotted against them on the part of their native officers.

There is still another point deserving of consideration. As things are, the use of the Persian language in the *Mofussil* courts is doubtless a crying evil ; but this cannot be expected always to endure. A large body of East Indians, flocking in various directions into the *Mofussil*, and spreading themselves all over the country, in quest of an honest, industrious, and useful livelihood, would go a considerable way to change the scene. Speaking English, as they do, as their colloquial, if not their vernacular tongue, they would naturally expect to be heard in English by their English Judges in the *Mofussil* courts ; and these could

never, for a moment, deny the perfect reasonableness of their request. Hence, Government themselves would soon see the manifest expediency of listening to their plea, as indispensably essential to the furtherance of the important ends of justice.

You will pardon me, Sir, for thus persevering in the contest of "a war of words;" persuaded, as I am, that your observations are made, as my replies are certainly given, on the broad basis of public principle. With me, Mr. Editor, this is no matter of mere dry speculation, but one of absolutely practical tendency, and which I hope may tend to some practical good.

I am, Sir,

Your obedient Servant,

A MERE PROJECTOR.

18th January, 1828.

To the Editor of the Bengal Hurkaru and Chronicle.

Sir,

When any opinion, (however erroneous,) has long dwelt upon the public mind, when it has acquired belief, and obtained approbation, all attempts at its refutation will be received with opposition, and perhaps with ridicule. It is with some dread, therefore, of being thought paradoxical, that I venture to oppose the remarks set forth in your paper of this morning by your correspondent, "A Lover of Right, and a Hater of Wrong." This writer, with much earnestness, and certainly with the best of intentions, re-

commends to the parents of East Indians to give their children the most liberal education possible, as the only way of securing their happiness, and improving their condition in the world. Now, Sir, all this sounds very well in theory; but let us, for a moment, suppose it applied to practice—let us, for a moment, suppose, that a father sends his son to a public school, spends almost all his fortune, and suffers many personal inconveniences and hardships, to be able to grant him a liberal education; well, Sir, what is the result of all this? Granting that the young man, (when removed from school,) possesses as much learning and knowledge as can be possibly acquired in this country, to what purpose can his talents be devoted? Suppose, (we shall carry our hypothesis a little further,) his father dies, and leaves the young man without friends, and without fortune, what is he to do for support? In such a situation, I doubt very much whether, with all his literary attainments, he will be able to obtain the situation of a common *Keranee*.

I am, Sir,

Your obedient Servant,

Calcutta, 14th January, 1828.

A. D.

A. D.'s proposition amounts to this, that the diffusion of knowledge is a curse. We can only say, that we do not agree with him.—ED.

Extract of a Letter from "An Impartial Observer," to the Editor of the Bengal Hurkaru and Chronicle, dated 21st January 1828.

" I allude more particularly to your remarks on A. D.'s letter. You say that his proposition amounts to this, that the diffusion of knowledge is a curse. What his ulterior views may be, I cannot say ; but, as far as his present communication goes, I think it contains nothing but the truth. He blames the Indo-Britons, (and very justly, I think,) that they are so anxious to give their children an education altogether unsuited to their future prospects in life. If, instead of giving them an education calculated to introduce them into one of the learned professions, (in which, under present circumstances, very few of them can hope to succeed,) they would train them up to a useful trade, they would doubtless act much more wisely : this, I suppose, is A. D.'s intention ; and this you have formerly declared to be your own persuasion. Instead, therefore, of discouraging A. D. and similar correspondents, you should, on the contrary, (according to my humble opinion,) afford every possible encouragement to discussions, so sensible, and so much calculated to point out to our Indo-British countrymen the only way in which their condition can be thoroughly and permanently improved."

Editorial Remarks on the foregoing Letter.

We are not aware, that we have ever, as "AN IMPARTIAL OBSERVER" intimates, expressed any opinion hostile to the education of Indo-Britons, though we certainly have

regretted that they should prefer the genteel slavery of the *Kerannie* to the honest independence of the mechanic. A. D.'s proposition, if we rightly understand it, goes much further than this; for it would restrict parents from giving their children a liberal education, when it is in their power to do so, lest they should be made unhappy by being unable to rise higher than to the office of mere writers. This is a sweeping condemnation of liberal education in the mass, to which we cannot assent. If liberal education were more universal than it is, its effects would not be to make men discontented with their lot, nor to aspire to stations beyond their reach; but rather to teach them the folly of repining, and to afford them resources for their hours of recreation, more worthy of a rational being than many they now seek. It is upon this principle, that the London University is established; and we should be glad to see similar means of instruction multiplied over the world. It is the duty of the instructors to inculcate the maxim, that "honour and shame from no condition rise," and to teach their pupils to appreciate the blessings of an independence earned by honest industry, by directing their attention to the noble examples the history of our own country affords. To qualify Indo-Britons for any trade, they must be taught to read and write; and this is all that is required to enable them to become *Kerannies*: a more liberal education, therefore, is not likely to increase their bias for that particular occupation, but, on the contrary, to teach them to despise its dependence and servility, and to prefer any honest avocation which promises to render

them independent. The disabilities, under which they labour, must give way to the influence of education. Knowledge will give them power ; and the day is not far distant, we think, when the learned professions and the offices of state will be thrown open to the competition of talent here, as they are at home.



“ If, instead of giving them (East Indians) an education calculated to introduce them into one of the learned professions, (in which, under present circumstances, very few of them can hope to succeed) they would train them up to a useful trade, they would doubtless act much more wisely.”

AN IMPARTIAL OBSERVER.

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

No doubt “ we are the men ; and wisdom will die with us.” A dismal and cheerless prospect for those who are to come after us !

Methought you had effectually given the “ *coup de grace* ” to your correspondent “ A. D.” in the editorial note appended to his communication ; but it seems that he has found a warm friend and supporter in “ An Impartial Observer,” who has now come forward to second him in his advocacy of the “ reign of ignorance,” for poor East Indians. The foregoing passage is an extract from his letter, as inserted in the Hurkaru of this morning ; and I feel

that it would be an unpardonable dereliction of duty in us, if we suffered so monstrous a doctrine to go forth in open day, without giving it the fullest and most unqualified contradiction.

Sir, what does the sum and substance of "An Impartial Observer's" dictum amount to? It resolves itself into two points; viz. the *curse* of a finished education, as applicable to East Indians; and the *blessedness* of comparative ignorance, so as to render them disqualified for any thing beyond the anvil, the last, and other such implements belonging to useful trade.

I am sure no one will ever dispute the point with "An Impartial Observer," so far as regards the training up of a due proportion of East Indians for occupations like those referred to; but what is to become of the rest? Considering the present scantiness of the European community, and the consequent limited demand for articles of wear and consumption suited to their taste, the employment of a very few hands in each trade would be quite sufficient to produce a complete glut in the market; and then may our artisans sit down, with keen appetites, over a delicious meal composed of boots and shoes, pictures and picture frames, tables and chairs, (all of their own manufacture,) in order to satisfy the loud cravings of that voracious demon, hunger.

I would say, By all means, let our young men be a well-educated community, qualified for practical purposes in every department of life. Education will never turn out to be an incumbrance to them, of which they shall be glad

to rid themselves. " Knowledge is power ;" that is, it is the true source of *moral power*. This will render them powerful in the general estimation of society, and equally so in the consideration of an enlightened Government ; who, whatever may be the prejudices of the age in which we live, will, sooner or later, see their own advantage in availing themselves of the qualifications of talent, industry, and integrity, wheresoever found, instead of carefully and jealously damming up their choice within the exclusive bounds of a narrow compass.

I am, Sir,

Your obedient Servant,

A MERE PROJECTOR.

23d January, 1828.

To the Editor of the Bengal Hurkaru and Chronicle.

Sir,

A death-like silence has prevailed with the public press in Calcutta, (*your* worthy portion of it excepted,) regarding the scheme of a " Commercial and Patriotic Association," as projected by me. Either the Editors are asleep at their post, and consequently need to be awakened, or they must deem the matter unworthy of public attention. Here, however, I cannot yield to them, even for a moment.

Plays, routs, and assemblies dance in rich variety throughout their columns. All the powers of vivid description are called into exercise, to pourtray their beauties and excellencies ; and all the eloquence of oratory is poured forth, to demonstrate their high claims to public

patronage and support. But all is morbid apathy and sluggish indifference, when any thing like a proposition is brought forward for opening a new source of honest, industrious, and useful livelihood ; and this, too, for a whole class, who are prodigiously increasing in numbers, and who may be said to have now arrived at an alarming crisis, in regard to the provision of the necessary means of subsistence. Such a subject, however interesting to the best feelings of the philanthropist, is too vapid to have any charms for the editorial department.

I have been led to this train of reflection, from my having sent, on Thursday last, a copy of my " Proposals " to each of the Editors of the Government Gazette, the India Gazette, and the John Bull ; not one of whom has shewn public spirit enough to call the attention of their readers to the subject, nor even so much as returned me the compliment of acknowledging the receipt of my gift. So much for the public press of India !

I am, Sir,

Your obedient Servant,

A MERE PROJECTOR.

22d January, 1828.

Editorial Remarks in the John Bull of the 24th January, 1828.

We should not have noticed the letter of " A mere Projector," which appeared in yesterday's Hurkaru, had it not been that the writer alludes to printed " Proposals," which he sent to our address, and which he says we have not had the civility to notice, or even to acknowledge. These

said "Proposals" were neither more, nor less, than the letters of "A mere Projector," reprinted from the pages of the Bengal Hurkaru; and we have really been so nauseated, and are daily so, with "*mere projecting*" trash in that paper, that it is no great claim on our attention, that the pamphlet should have come to us through this channel. While we approve of every attempt to ameliorate the condition of the Indo-British race, we consider it as a misfortune to this body, that their cause should be in the hands of the Mere Projector, *et id genus omne* of the Hurkaru. The farrago of nonsense and *radicalism*, with which what is good and practical is constantly mixed up, must deter every man of taste and judgment from bestowing the slightest attention on the various plans proposed in this quarter, with a view of bettering the condition of the Indo-Britons; and, until more respectable and able advocates arise, to take the business in hand, it would be but a waste of time and labour to give our aid to writers, who are really so unworthy of notice.

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

In my letter of the 22d instant, I adverted, as I think I had just reason to do, to the death-like silence, which prevailed with a certain portion of the public press, regarding my scheme of a "Commercial and Patriotic Association," as published in a pamphlet circulated by me; and now the Editor of the John Bull comes forward, not

only to plead a justification of his own conduct in this respect, but absolutely to make a wanton and unmerited attack upon me, as the author of that scheme. Let it be so; and I will at once hasten to reply to him, confidently looking for the unbiassed verdict of a liberal and an enlightened public on the real merits of the case.

The Bull says, "~~These said~~ 'Proposals' were neither more, nor less, than the letters of 'A mere Projector,' reprinted from the pages of the Bengal Hurkaru." Disputed. *Less*, I grant they were not; but *more* they certainly were, by the addition of a suitable "Preface" to the letters, calculated to elucidate the views which led to their being penned. Here, then, let the public decide.

The Bull goes on to say, "and we have really been so nauseated, and are daily so, with '*mere projecting*' trash in that paper, (the Hurkaru,) that it is no great claim on our attention, that the pamphlet should have come to us through this channel." Here, Sir, may be seen, in a few words, all the blind and bigotted stubbornness of Jewish prejudice. "Can there any good thing come out of Nazareth?" Where prejudice reigns in such perfection, I despair of any success in the sober cause of truth. "Nauseated!" No compulsion, Mr. Bull. It is not my office to cram any thing down people's throats, against their will. Spare your nostrils for more odoriferous scents, and your stomach for more palatable food. "It is no great claim on our attention, that the pamphlet should have come to us through this channel." There is some ambiguity in this passage. The "letters" certainly made their first ap-

pearance in the columns of the Hurkaru ; but the Editor of that paper had no hand whatever in the business, beyond giving publicity to what was sent to him in his *editorial* capacity ; and, least of all, in circulating the “ pamphlet” among his brother Editors, (how *brotherly* they are !) as the Bull’s language would seem to imply. But, even admitting, for the sake of argument, that all that is implied by the Bull was really done, a *mere channel or tube* cannot possibly change the essential nature or quality of *the thing itself*. This, if prejudice were out of the way, ought alone to have engrossed the attention of a public Editor.

But again. The deponent saith, “ While we approve of every attempt to ameliorate the condition of the Indo-British (evidently meaning East Indian) race, we consider it as a misfortune to this body, that their cause should be in the hands of the ‘ Mere Projector’ *et ed genus omne* of the Hurkaru.” Here the Bull speaks at random, without perceiving his own folly. Pray, Sir, what does the Bull know of the “ Mere Projector.” I am sure that the latter has never had any sort of communication with him, either individually or editorially. He must then judge of him from the criterion placed before him in the “ Proposals,” over which he previously maintained the death-like silence complained of. If it be so, the “ Mere Projector” has the consolation to think, that he has received the most encouraging testimonials from respectable and worthy individuals, who differ *toto cælo* in opinion from that expressed by the Bull ; and, after all, this is

but a matter of opinion, not to be dogmatically fixed by the mere dictum of a "Bull."

Further. "The farrago of nonsense and radicalism, with which what is good and practical is constantly mixed up, must deter every man of taste and judgment from bestowing the slightest attention on the various plans proposed in this quarter," (meaning of course the poor Hurkaru,) "with a view of bettering the condition of the Indo-Britons," (*alias* East Indians.) From all this, it appears, that the Bull evidently holds the Hurkaru responsible for the views and sentiments developed in my letters; but this is not what is called fair play, and certainly very unlike the conduct of the real English John Bull, who is so much noted for the display of this prime quality. All the heap of "nonsense and radicalism," therefore, must be laid at *my* door. "Nonsense!" To this charge, I plead, "Not guilty, my Lord." I deny all intercourse with such a personage. "Radicalism!" Ah! Sir, a true spirit of sound radicalism, (but not in the perverted and distorted acceptance of the term,) is a principle which, if fully brought into operation, is fraught with ample blessings to mankind in any part of the world. What, for instance, would England herself, (that so-much-boasted country,) have been, without it? This, Sir, is really base ingratitude to the best friend to human happiness. May this friend never want a friend in every bosom, not sunk to the debasing practice of servility and false adulation! But again. "Taste and judgment!" If the Bull has an exclusive monopoly of these desirable qualities, I shall not fail to apply to his shop for a due supply of them,

whenever I may be brought to think that my own stock is fairly exhausted.

Once more, and no more. “ And, until more respectable and able advocates arise to take the business in hand, it would be but a waste of time and labour to give our aid to writers, who are really so unworthy of notice.” Now we have arrived at the climax of *Bullism*. “ Respectable and able !” For the true definition of the term “ respectable,” I will never have recourse to the aid of the Bull. He will perhaps tell me, that “ true respectability” consists in an abundance of wealth, rank, and such like external ingredients. Not so, says the vocabulary of my own mind, which will assist me in this matter more than all the Bull in the world. “ Able !” Of the Bull’s wonderful ability, there can be no question; and I will not, therefore, dispute the matter with him. “ Unworthy of notice !” This is the highest compliment that could be paid to me from such a quarter.

I am, Sir,

Your obedient Servant,

24th January, 1828.

A MERE PROJECTOR.

Commercial and Patriotic Association.

A public meeting will be held at the Exchange Rooms, on Thursday next, the 31st instant, *precisely* at 11 o’clock in the forenoon, to take into consideration the feasibility of a scheme set forth in a certain pamphlet, entitled “ Proposals for forming an Association, to be called the Commercial and Patriotic Association.”

24th Januray, 1828.

To the Editor of the John Bull.

SIR,

When the Editor of the Chronicle* took it upon himself to characterize a considerable and useful portion of this community, as living in a state of “ genteel slavery,” it would have been well, had he paused, and considered the comprehensive nature of the term.

Thanks for the modicum of common sense, which we are supposed to possess, in common, and perhaps in an equal degree with even the “ great plural of one,” the *mouth-piece* of the radicals, his position is but a “ quod est demonstrandum,” illiberal, dogmatical, and absurd.

Let us examine it. The *Keranees* are living in a state of “ genteel slavery.” What is a slave? An unfortunate, whose every physical power is devoted, through dread of punishment, to the unrequited service of a fellow-man. What do *Keranees*? They not only are copyists, but accountants, &c.; and it is through their unostentatious labours, that the mighty engine of Government is kept in constant play. They are the connecting links, however humble, still as serviceable, as the proudest in the chain of society.

Now I would ask, Mr. Editor, with all deference, (the case cannot apply to you†,) what is the hired Editor of a newspaper? In some cases, the servant of the servant of a servant. What is any one who receives pay from a su-

* The Bengal Hurkaru and Chronicle.

† Our correspondent is mistaken.—ED.

perior, if judged by this ridiculous and detestable standard? Let him answer.

The sure method to render any class disaffected and unhappy, is first to make them discontented. This is in entire accordance with the radical system. There is a fund of gullibility in human nature, which always affords ample scope for the machinations of designing men. The toils are in abundance; but the master spirits to handle them for evil, are, thank Heaven, but few.

What would he *with us*? We are “genteel slaves.” Upon his own shewing, what is he? We give the labour of the hand, the application of the mind, for what feeds and clothes us, and all that are dear to us. What does he more? We will tell him he does less. We work our way in the world, humbly perhaps, but not uselessly. We excite no disaffection, render none discontented, sow no feuds in a peaceable society, strain no nerve for paltry party purposes, are grateful to a considerate Government, and have sufficient sense to direct the wolf with sheep’s clothing.

AN UNCOVENANTED ASSISTANT.

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

“An uncovenanted Assistant,” in the John Bull of this morning, seems to take serious umbrage at the term “genteel slavery,” as applied to that particular tribe, to which he belongs.

As I am not less “An uncovenanted Assistant” myself, I think I have an equal right to speak on a point that equally concerns me. I am sure, that, as far as my daily feelings go, “genteel slavery” is by no means so harsh, or unjust an expression, as to excite indignation in any quarter. We all know, that

“Shame and contempt *from* no condition rise;

“Act well your part, and *there* true honour lies.”

But still, as matters stand, in our depraved world, men are apt to look only at the *surface* of things ; and a poor worm of a man, elevated above a certain level, is too prone to treat, with supercilious contempt, all those below him in the graduated scale of life. Hence the “genteel slavery” spoken of ! Viewing the matter in this light, it will perhaps be found, that “genteel slavery” is too mild and gentle a phrase, to be universally applicable in every case ; since, where the head of a public office happens to be a tyrant, or a narrow-minded man, a sort of “vulgar slavery” is more likely to prevail. But we ought always to discriminate between the conduct of one man, and that of another ; giving due credit and praise wheresoever merited, and blame and reprobation wheresoever called for.

The John Bull, however, is known to be an avowed advocate of every species of slavery all over the world ; and I really grieve to see “An uncovenanted Assistant” giving him even the slightest countenance in the political creed, which he has carved out for himself.

So far as I am personally concerned, truth and justice require me to say, that I have no reason to complain of illi-

beral, or ungentlemanly conduct among the upper branches of the office where I am ; but such my experience is of course confined to myself, and I am precluded from speaking as to what may take place elsewhere ; though I should hope, for the honour of human nature, that the cases of tyrannical conduct are few, if any at all.

I am, Sir,

Your obedient Servant,

ANOTHER UNCOVENANTED ASSISTANT*.

26th January, 1828.



To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

I fear that much misconception still prevails in certain quarters, regarding the real scope and design of my scheme of a "Commercial and Patriotic Association;" and you will allow me, therefore, to be guilty of further intrusion on your valuable columns, in order to throw additional light on the subject, preparatory to the Meeting, which is to take place at the Exchange Rooms, as publicly advertised, on Thursday next, the 31st instant.

A mere mercenary consideration of the scheme, though highly important in its place, and constituting, in fact, the very key-stone of the thing, so far as tangible resources

* In this case, I changed my signature of "A mere Projector" for "Another uncovenanted Assistant," to shew that I also had an experimental knowledge of the matter.—*Note by the Author.*

go, is nevertheless placing the matter on the lowest possible ground that we can take. It is the *patriotic*, or, if you choose, the *philanthropic* part of the scheme, that more especially deserves our highest consideration. It is this, Sir, and this alone, that ennobles and places it upon a lofty position, from which we may look down, with a sort of self-complacency, upon mere groveling and less brilliant points.

East Indians, as a **distinct class**, have sprung up in this country within the last fifty or sixty years ; during which period, their numbers have so prodigiously multiplied, and are now more rapidly multiplying, as to occasion just cause of serious concern in the minds of parents and guardians, in regard to their future destiny in life. “ But if any provide not for his own, and specially for those of his own house, he hath denied the faith, and is worse than an infidel.” This naturally gives rise to a question teeming with awful importance, “ What will become of this numerous class, in relation to the necessary means of subsistence ?” In our own day, a considerable majority of them are enabled to earn their livelihood at the desk, and in the counting-house ; but are we quite sure that these desks and these counting-houses, (existing, as they necessarily do, on the narrow principle of self, and not for the sake of making a provision for the public wants,) will keep a regular pace with the progressively growing numbers of East Indians ? The natural result flowing from this, will be a *large redundant East Indian population out of employ* ; and these must be thrown back upon their own resources for

earning a livelihood, or be left to the last alternative, to beg and borrow, pilfer and steal, starve and perish, in this the very land of their birth. How truly appalling and revolting must be such a thought, to a mind not wholly lost to human sensibility !

As a mere palliative for this general mass of public evil, the Marine School, it is true, will open a new field of honorable industry and enterprize to a certain class of East Indians in a watery element, and perhaps eventually tend to remove some of them to distant climes more favourable to success in life. For all the good that may be thus done, every one will no doubt readily join in applauding the exertions of those who are now engaged, or who may hereafter be engaged, in this particular department of benevolent labour ; but still it must be allowed, at the same time, that this will never stretch itself out to such an extent, as to reach the case of our landsmen, for whom the wide field of agriculture, trade, and commerce is alone doubtless provided by the all-pervading care of a bounteous Providence.

Hence, the *patriotic* branch of the projected Association will go to embrace precisely the deliberation and consummation of practical points connected with this important subject. It will be for them, whilst busy for the success of their own immediate undertaking, to extend their views *beyond* themselves, and to cast an eye of paternal and sympathetic benevolence over the East Indian branch of the rising generation around them. Should any measure of splendid success ultimately attend their laudable operations,

they might take advantage of every possible resource that sky, air, earth, or sea, may present before them, for opening new doors of honest, useful, and industrious livelihood for those who will assuredly stand in urgent need of all their best counsel, advice, and support; and I am fully persuaded, that, in a wide and fertile country, possessing such vast capabilities as ours, a great deal might be done in a thousand yet untold ways for promoting the legitimate and diversified ends of the Association. In a word, with a steady honesty of purpose, and devotedness of soul, with a calm sobriety of judgment, and energy of action, backed by a due adequacy of capital, they might safely become, as it were, a grand centre of union among the East Indian community, and undertake the noble office of public guardians to the real welfare and interests of that community, on a large scale.

This exalted and ennobling view of the matter, renders my commercial scheme perhaps altogether different, in principle, from every other commercial undertaking in the world; and still it is the very infusion of such a principle, that redeems it effectually from the character of a mere dry, mercenary speculation, and raises it far above the level of mere groveling, selfish commerce; thus converting it, as it were, by the power of magic, into a noble engine of public usefulness, admirably adapted to the peculiar emergency of our desperate case, in this the very land of our birth.

It may be as well for me explicitly to declare, once for all, that no invidious distinction is meant to be drawn, by

any of the foregoing observations, between one class of the community and another. Far from this. All I contend for, is, that, situated as East Indians are, it is imperative upon them, as a distinct class, to engage in some public undertaking, calculated to enhance their comfort, honour, and respectability in life; but, while we do so, we may, and indeed ought to hold out the cordial hand of fellowship to all around.

I am, Sir,

Your obedient Servant,

A MERE PROJECTOR.

28th January, 1828.

P. S.—I feel much obliged to you for having devoted so much space in your columns to the several communications, which I have addressed you, on the subject of my scheme; but, Sir, I will not take advantage of such a concession made by you, as I know, purely on the ground of public principle; and this will, therefore, be my *last* to you.



To the Editor of the John Bull.

SIR,

The enclosed letter was addressed, on the 26th instant, to the Editor of the *Hurkara*, who, however, did not think it proper to insert it in his paper, though he had so readily inserted the letters of the “Mere Projector,” which you have so justly characterized as unworthy of your notice. However absurd the “Mere Projector’s” proposals are,

there are still some who look up to him as a leader, and an oracle; and I conceive it accordingly advisable, that his utter unfitness for the part which he endeavours to act, should be exposed, and the unwary be put on their guard against such an incompetent guide. “For, if the blind lead the blind, they shall both fall into the ditch.”

I am, Sir,

Calcutta,	}	Your obedient Servant,
29th January, 1828.		A PUBLIC WATCHMAN.

N. B.—Commercial and Patriotic Meeting to be held on Thursday next.



To the Editor of the Bengal Hurkaru and Chronicle.

Pray, what are you about, Mr. Editor? Are you not sleeping upon your post? There is at present an astonishing movement in Calcutta; and you do not give your readers any notice of it! If Messrs. Mackenzie, Lyall, and Co. were not so polite as to send me their Gazette, I should, till now, be entirely ignorant of the grand Meeting, which is to be held at the Exchange Room, on Thursday next, the 31st instant, at 11 o'clock in the forenoon, to take into consideration the feasibility of a scheme set forth in a pamphlet, entitled “Proposals for forming an Association, to be called the Patriotic and Commercial Association.” If you are not more attentive to the important events and movements, which take place in Calcutta, I am afraid your readers will discard your paper in favour of the “Exchange Gazette and Daily Advertiser,”

particularly as the latter is so strongly recommended by the circumstance of its being circulated gratuitously. In order that the interests of your paper may not suffer through your neglect, allow me to call the attention of your readers to this important Meeting. It is true, you have politely shewn, that the plan of the " Mere Projector," in its principal features, is exceedingly injudicious, if not impracticable ; and your brother Editors did not even think it worth their while to take any notice of his proposals. But of what consequence is that to a man of the " Mere Projector's" mighty mind and powerful energy ? You said, as I thought very truly, that, instead of forming such an Association, it would be much more advisable surely to lend money to such as are qualified for conducting a sugar, cotton, indigo, or other manufactory, upon the security of the concern ; and, indeed, that the East Indians would naturally much rather settle in Calcutta than in the *Mofussil*, where they are deprived of the protection of the laws of England. But the " Mere Projector's" confidence in the excellency of his plan, is not in the least shaken by your objections. To your first objection, he returns no answer at all* ; for his answer of the 15th instant, I, with my poor understanding, cannot consider as any answer ; and to your second objection, he boldly replies, in his letter of the 18th, that, if the three Jewish worthies could venture into " the burning fiery furnace," (because they would obey God, rather than men,)

* My reason for " returning no answer at all to this objection," has been already explained in a note subjoined to the editorial article referred to.—*Note by the Author.*

surely the East Indians might safely venture to the *Mofussil*, for the laudable purpose of earning an honest livelihood for themselves; for certainly the *Mofussil* is not yet quite so bad as "the burning fiery furnace;" and, in all other respects, the cases are evidently quite parallel. Moreover, he shews plainly, that, as rulers *ought* not to be a terror to good works, but to the evil, the rulers in the *Mofussil* would doubtless *be* to the East Indians what they *ought* to be; so that, so far from "oppression and degradation," they would only meet with "praise."

But that the other Editors have not taken any notice of his "Proposals," is of course no objection at all. Indeed, he most probably sent a copy to them, *merely* for the purpose of obtaining the honour to see no notice whatever taken of them. For, when the Editor of the John Bull told him, a few days ago, that they were unworthy of any notice, he told him, in reply, that this was the greatest compliment that could be paid to him from that quarter.

From such evident tokens of the unduanted spirit, and astonishing energy, of which the "Mere Projector" must be possessed, I anticipate the most glorious results from the Meeting on Thursday next. But still there may be something wanting to give it its due effect. When, on the 1st January 1821, a similar projector proposed a Meeting, for the purpose of "laying the foundation of a public seminary, to be established upon approved principles, and to be called the "Eurasian College," he very judiciously recommended, that every one who would assist in this august ceremony, should hold in his hands an "empty vessel,"

the description of which filled no less than seven pages in the "Appeal to the whole body of Eurasians," and which was no less than "the most significant and capacious phrase, Eurasian," which "at once, as if by a single blow, removes the present vacillancy of things," and "alike removes all petty prejudices and obstacles, and embraces within the range of its sweeping scope the whole body of the descendants of Europeans." What has become of this remarkable "empty vessel", I do not know: I guess, however, that its "repletion" with sweet-smelling ingredients has been so often, and so successfully completed, that it is no longer of any use. I would, therefore, strongly recommend to the "Mere Projector," to provide in due time a similar "empty vessel," which those may hold in their hands, who shall assist in laying the foundation of the "Commercial and Patriotic Association."

One word more, Mr. Editor, and I have done. The result of the Meeting on Thursday next will doubtless be a grave spectacle, which every inhabitant of Calcutta will necessarily wish to witness. For thus says the "Mere Projector," in his Proposals, page 11. "All this, and more, may be done by forming small associations for the purpose by dozens and scores; and thus let a goodly number of us walk out of Calcutta, in solemn silence, as unworthy of us." This solemn procession of the "Mere Projector" and his friends from this wicked city, so unworthy of the favour of their presence, will be so important a transaction, bearing so awful an aspect towards Calcutta, and replete with such joyful prospects to the *Mofussil*, which is stretch-

ing out its arms to receive them, that I should be very sorry, from want of information, to be prevented from witnessing it. Pray, therefore, Mr. Editor, do not again neglect your duty, as you have done in the present instance ; but let us have in due time notice of this important event, that we may witness it with mingled feelings of grief and joy,—of grief, at our unworthiness, and consequent loss of such a “ goodly number” of the most worthy citizens,—and of joy at the days of happiness beaming on the highly favoured *Mofussil*, and at the beginning of the power and glory of Eurasia’s sons.

I am, Sir,

Calcutta,
26th January, 1828. }

Your obedient Servant,
A PUBLIC WATCHMAN*.

* A public Watchman would seem to forget, that he is, in fact, waging war with the very constitution of Nature. “When I was a child, I spake as a child, I thought as a child, I understood as a child,” was the honest and noble confession of a Christian apostle. Upon the same principle, it may perhaps be allowed me to say, that the “Eurasian” of January 1821, was a mere child, compared to the “East Indian” of January 1828. A period of seven years is said to amount to a climacterick in human life ; and is a whole climacterick of no account with “A public Watchman?” But, for his conviction, let us place before him a living anecdote, or two, in high life, as it is called.

When the Duke of Wellington ran his military career in India, some five-and-twenty years ago, he was thought to be far behind, even as it regarded the first qualification of a soldier’s courage ; but we see what the revolution of one or two climactericks in his life has produced. Though still generally regarded as a poor statesman, he has, for the last twelve or fourteen years, worn the palm of the great

Captain of the age. To look nearer home, however, a certain gentleman in the East India Company's civil service, was, as I understand, thought to be a great dolt, whilst at college some twenty-eight or thirty years ago; but, now that "he has reached the tip-top of the tree," who will deny that he possesses a decent portion of the qualifications peculiar to a talented public servant?

Now what will "A public Watchman," say to all this? If he will refer to his own mental experience, too, he will find, that perhaps but a little while ago, he was, comparatively speaking, in a sort of slumber; whereas, now, he is qualified, as he thinks, to exercise the office of "A public Watchman" in Calcutta, a supererogatory office, I must confess, however, so far as it regards my scheme, which stalked forth in open day, and invited public scrutiny in all the newspapers, many days before "A public Watchman" was roused from his slumber.

In treating my former scheme of an "Eurasian College," as projected in January 1821, with sneer and ridicule, "A public Watchman" would seem to possess a handle for his purpose, from the failure of that scheme. Subsequent experience, I am free to confess, soon enabled me to see, that *an over-calculation of the state of things at that period*, was the rock on which I split; but I will ask "A public Watchman," whether, after a little further experience as to the actual state of things, recovering myself again, I did not return to the charge in January 1823, and carry my point on the 1st March of that year, though on a smaller scale?

"A public Watchman," in the depth of his wisdom, puts me down as "a blind leader of the blind." It is some consolation for me to know, that this is but a mere matter of opinion, and not borne out, by a positive demonstration in fact; but let us, for a moment, examine the claims of "A public Watchman" to a character opposite to that which he has assigned to me. Upon the very face of the thing, he appears to me to be justly chargeable with a sort of *owlish* "blindness," in overstepping the precincts of his own sphere, the darkness of the night. As a nocturnal watchman, he might have

done well enough ; but only look at his folly, in assuming the character of " A public Watchman," to give a false alarm to the good people of Calcutta. As if all had been a work of darkness, he beats a rapper at the ears of the public, to call their attention to an open-day transaction, that must have attracted their daily notice, without his aid ; since the Bengal Hurkaru and Chronicle, as well as the John Bull, teemed with discussions regarding my scheme ; and a notice, moreover, appeared in the Exchange Gazette Advertiser for a week prior to the day of public Meeting, and in all the other papers on that very day.—*Note by the Author.*

Editorial Remarks on the foregoing Letter.

A letter in our paper of this day, under the signature of A PUBLIC WATCHMAN, has drawn our attention (a) to a " *Public Meeting*," to be held this forenoon at the Exchange Rooms, to take into consideration the feasibility of a scheme, lately propounded in a pamphlet, for the establishment of what is to be called " *A Patriotic and Commercial Association.*" It is perfectly astonishing to what length of folly people will sometimes go (b) ; yet it would not surprise us, although this " *Public Meeting*," called by *nobody knows who* (c), to discuss the merits of a scheme published in a pamphlet by *nobody knows whom* (d), to hear that this " *Public Meeting*" has found attendants. The

(a) Not quite correct. My public " *Notice*" in the John Bull newspaper, sent with a note addressed to the printer under my own signature, must have already drawn the Editor's attention to the subject.

(b) To convene a public Meeting, to take into consideration the feasibility of a public object proposed to be accomplished, is a mark of " *folly*," in the estimation of the Bull !

(c & d) I hope the Bull will maintain his pretended ignorance, when the time comes for sending his bill to me for the public " *Notice*" inserted in his paper, convening the Meeting. Will he then say, " *This notice was sent to us by nobody knows who ?*"

grand scheme, which "the pamphlet" proposes, is especially directed to the benefit of "East Indians," a term which we apprehend is to supersede those formerly and hitherto employed to designate the intermediate class between the Europeans and natives. Our correspondent alludes to this class under the designation of Eurasians (*e*); but we thought, until now, that Indo-Britons had been generally regarded as the most descriptive. We can have no quarrel with men taking what denominations they think fit; only when they hit on terms calculated to convey an inaccurate, or improperly defined idea of what they are meant to express, we must exercise our right to criticise them. It is on this account, that we must contend that "Indo-Briton" is a better denomination than "East Indians" (*f*); and one which we should like to see superseding "half-cast," the name still applied at home, even in Parliament itself, to the body we are referring to. We certainly object to "half-cast" (*g*), both as being regarded in-

(*e*) This was a designation adopted by me some seven years ago, for want, as I thought, of a better; but, when the Dinner Club, established by Dr. Paris Dick, and certain others of my countrymen at the Town Hall, in April 1825, designated themselves "East Indians," I readily concurred in the preference of this above the other designation, and even defended the propriety of it against the cavils of others in the newspapers of the day. This, at least, is enough to shew, that I am not so wedded to a name of my own coining, when a better is proposed to be substituted in lieu of it.

(*f*) By no means. "Indo-Briton" is an *exclusive* term, confined to the descendants of Britons in India. Not so is "East Indian." It is a more *general* term, including all the descendants of Frenchmen, Danes, Dutch, Portuguese, &c.

(*g*) Do you, indeed? A wonderful change, then, must have been wrought in your mind since April 1823, when you seemed to take a peculiar delight in branding us as "half-casts;" though, as you had then been in the country about seven or eight years, you could not but have been aware that the term was "regarded inimically by the class on whom it was fixed." See *Oriental Magazine* for April 1823, page 531. This

imically by the class on whom it is fixed, and as designative of that class, only in the first degree ; but we are at a loss to see the necessity for substituting a name in place of "Indo-Britons (*h*)," which, like "East Indians," can only lead to a confusion of ideas, and which will always require explanation by those which we, or our correspondent, would in preference employ.

But, by whatever name this class of British subjects is to be known, it becomes them to weigh well, whether such "projects" and "meetings," as are now on the tapis, are calculated, either from the weight or number of those who take the lead in them, or the manner in which they are brought forward, to promote the respectability of the general body (*i*). We decidedly think not; and our correspondent, *A public Watchman*, is of the same opinion (*j*). The result

gave great offence to your East Indian subscribers, some of whom not only very properly resented it by letters individually addressed to you as Editor of the Magazine, withdrawing their names from your subscription list, but moreover gave vent to their feelings in the Calcutta Journal for April 1823, page 655, and for May of the same year, page 141. You then wrote a long-winded apology in a "Notice to Correspondents," prefixed to the Oriental Magazine for May 1823 ; but even this did not atone for the offence, as the apology was couched in terms that did not bespeak the sincerity of your proffered apology, and a consequent desire to heal the wound you had so wantonly inflicted. Perhaps these are *oriental* ideas of reparation, suited to the pages of an Oriental Magazine.

(*h*) Already explained, and requires no further observation.

(*i*) This passage savours of rank *Toryism*, carried to a high pitch of absurdity. The Bull always speaks of "respectability." If he will favour with his definition of the term, I shall endeavour to give it a place in the next edition of Johnson's Dictionary that may be published. For my part, I would say, that "Projects," and "Meetings," and "Associations," are precisely the way to enhance our own respectability in life, provided none of these are infected with a taint of vice, or immorality. Let all our proceedings rest on the firm and immoveable basis of Christian morality ; and they will, then, bear the test of fair and unbiassed criticism all over the world.

(*j*) No doubt, *you* and *your* correspondent "are the men; and wisdom will die with you !"

of this day's Meeting will, however, tend to enlighten us, in regard to the probable result of the project, and the quarter in which it finds its origin (*k*), and from which it expects, and is to meet with success. It is obvious, in the mean time, that, if any individual chooses to put a notice into a public Advertiser, that a meeting of the class in the community, to which he belongs, is to take place, to consider a scheme which he himself has concocted, and thinks very fine and feasible, he may go far to compromise the good sense of that class, should his plan be a foolish one (*l*) ; and, were it ever so wise, by the same rule, the most senseless might be made to appear as worthy of the serious consideration of the public. This observation we offer *in limine* : how far any thing may be said, or done, at the Meeting, demanding either praise, or censure, remains to be seen (*m*) ; and we reserve ourselves to act, as, in our apprehension, circumstances may require.

*Editorial Notes in the Bengal Hurkaru and Chronicle
of the 1st February 1823.*

TO CORRESPONDENTS.

Our only reason for not inserting "A PUBLIC WATCHMAN'S" letter, was, that we did not wish to afford a pretext

(*k*) What superlative dissimulation !

(*l*) This is one way of prejudging the question.

(*m*) The Full, I understand, sent a deputation from his office to the Exchange Rooms on the day of the Meeting, to witness our proceedings ; but, as there was nothing discreditable in them, he was spared the noble gratification of a laugh, and a sneer, at our expense. He has even studiously avoided the publication of the Resolutions passed at the Meeting, a copy of which was sent to him for that purpose. Is this what the Bull calls fair dealing ?—*Notes by the Author.*

for the continuance of a discussion, to which we conceived, differing essentially as we did from the author of it, we had already devoted sufficient space. It is true, we did insert one letter from the opposite party afterwards; but it was under the pledge that it should be the last, which it would not have been, had we inserted "A PUBLIC WATCHMAN'S" letter.



Commercial and Patriotic Association.

At a Public Meeting held at the Exchange Rooms, on Thursday morning, the 31st January, 1828.

On a motion made by Mr. Wale Byrn, and seconded by Mr. S. P. Singer, Mr. J. W. Ricketts was unanimously called to take the chair.

Mr. Ricketts rose to observe, that he felt the honor conferred upon him by their selection of him as a Chairman, on the interesting occasion of this respectable and numerous audience; and, after having read the public Notice in the Exchange Gazette Advertiser, by which this Meeting was convened, proceeded to state, at full length, the purport and nature of the Association contemplated to be formed on the present occasion.

After considerable discussion on different points connected with the subject, the following Resolutions were unanimously acceded to, and passed :—

1. That this Meeting, duly appreciating the force of the sacred claims, which the East Indian branch of the rising generation have upon their sympathy and regard, deem

it their duty to form themselves into an Association, to be called " The Commercial and Patriotic Association."

2. That, though the scheme of such an Association has emanated from an East Indian, (since it must emanate from some quarter or other,) and has consequently a special eye to the good of the East Indian community, it shall nevertheless be freely and fully open to the admission of all, whether Europeans or Natives, who may be found willing to join the Association.

3. That each and every individual contributing, at one payment, the sum of Sicca Rupees one thousand, as his personal share in the joint stock, shall be considered a Member of the Association, to all intents and purposes.

4. That the whole of the property, of whatever kind, thus originated, shall constitute the joint stock of all the Members composing the Association, for their individual and mutual benefit, according to the extent of their own interest at stake.

5. That each and every Member of the Association shall be at liberty to take as many shares in the joint stock, whether for his own benefit, or in behalf of others, as he may be able to pay for.

6. That the purchase of three shares in the joint stock, shall entitle such individual share-holder to an additional vote, (beyond that which he possessed from the purchase of a single share,) in all matters connected with the Association; and that the purchase of six shares shall, in like manner, entitle him to the privilege of still another vote in those matters; but no individual shall be considered to

enjoy more than three votes, under any circumstances, and whatever may be the amount of his shares in the joint stock.

7. That each and every share in the joint stock, shall be held transferrable from one hand to another, at the option of the individual share-holder, according to such rules as may be framed hereafter for the guidance of the Association.

8. That no individual share-holder shall be permitted to withdraw, either on his own account, or that of others, any share or shares from the joint stock of the Association.

9. That the primary and leading object of the Association shall be to engage, through the medium of proper instruments employed by them for that purpose, in the wide field of agriculture, trade, and general commerce, in order to promote the substantial interests of the undertaking.

10. That, should ultimate success attend their united operations for one common object, under the Divine blessing, the Association shall hold it to be a sacred and interesting part of their duty to watch over, and promote, by every legitimate means in their power, the real welfare and interests of the East Indian branch of the rising generation around them, including all such youths of European descent, as may be destined to be born, to live, and to die in this country.

11. That the Association shall, in the case above contemplated, equally hold it to be their highest duty to promote the work of sound and wholesome education among

the native population, and to introduce a spirit of general improvement into all the available resources of the country around them, on such a scale as circumstances touching their financial prosperity may warrant.

12. That the affairs of the Association shall be conducted by a Committee of Management consisting of seven Members, including a Corresponding Member and Secretary, who are to be annually chosen, with the general consent and sanction of the Association, and any three of whom shall be deemed competent to form a *quorum* for the transaction of business.

13. That each and every Member of the Committee of Management, shall and must necessarily be a shareholder in the joint stock of the Association.

14. That the following gentlemen be chosen to act as a Committee of Management for the ensuing year; viz. Messrs. W. Dacosta, J. Fountain, A. Imlach, R. Kerr, Baboo Rammohun Roy, J. W. Ricketts, and S. P. Singer.

15. That Mr. J. W. Ricketts be appointed Corresponding Member and Secretary to the Association.

16. That a general Code of Rules shall be prepared by the Committee of Management, for the future guidance of the Association, and for the due consummation and accomplishment of all the practical purposes contemplated by them.

17. That no vacancies, whether in the Committee of Management, or in the office of Corresponding Member and Secretary, shall be filled up, without the general consent and sanction of the Association, or at least of a majority

of votes, obtained either in writing by a Circular, or at a General Meeting specially convened for that purpose.

18. That an Annual General Meeting shall be held on the 31st January of every year, being the happy anniversary of the formation of the Association, (or on the 30th of that month, should the former happen to fall on a Sunday,) at such time and place as may, in each instance, be determined upon, for the purpose of inspecting the accounts of the Association, and of ascertaining the real state of their affairs.

19. That Messrs. W. Dacosta and Baboo Rammohun Roy be appointed Joint Treasurers to the Association, for the purpose of receiving monies, and making disbursements on account of it, under such rules as may hereafter be framed for their guidance.

20. That a subscription book shall be immediately opened by each Member of the Committee of Management, for the reception of the names of all those who may be willing to become share-holders in the joint stock of the Association.

21. That the Resolutions now passed at this Meeting, shall be published in all the newspapers in Calcutta, for the general information of all classes of the community, in order that those who may feel so disposed, may have an opportunity of joining the Association.

Moved by Mr. Wale Byrn, with some prefatory observations on his part*, and resolved unanimously,—

* The following is the substance of the prefatory observations referred to.
Mr Chairman. Impressed with a deep sense of the useful services rendered by you, I rise with feelings of much gratification to propose a vote

22. That the warm thanks of this Meeting be given to Mr. Ricketts, for his laudable exertions for the public good, and for his able conduct in the chair on this occasion.

Mr. Ricketts feelingly acknowledged this vote of thanks, with an assurance that he duly appreciated the motives, from which it arose.

Moved by Mr. Ricketts, and resolved unanimously,—

23. That the cordial thanks of this Meeting be given to Messrs. Mackenzie, Lyall, and Co. for their disinterested readiness in accommodating us with the use of the Exchange Rooms on this occasion.

JOHN W. RICKETTS,

Chairman.

of thanks to you—not merely, Sir, for your conduct in the chair; though of that, it would be unnecessary for me to say any thing in praise, as the Meeting has been a witness of it,—but also for the services rendered by you to the community. The works of a man testify to his worth; and it is by them we are enabled to estimate the value of that worth. I would but just refer to the career you have run, to shew that it has been a career of public usefulness. To your exertions, do we owe the existence of the Parental Academic Institution; an Institution, which has already achieved much good; which is calculated to do much good; and which, I trust, will confer lasting benefit on our children. That Institution will always be a memento of your useful labours; and, Sir, if nothing else were done, yet, by its formation, you would have bestowed a rich legacy on your countrymen.

And now, Sir, amid your unceasing exertions for our well-being, we have been assembled by you for the consideration of a project which is intended for our benefit; a project which is, in my opinion, well calculated to produce this result. I shall only say, Sir, that I trust it will realize the expectations formed of it.

I must now, Sir, submit to the Meeting to adopt the vote of thanks proposed by me; nay, Sir, I may with confidence demand of them their hearty concurrence in the measure.

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

I was one of the few who attended the public Meeting at the Exchange Rooms this day, for the purpose of forming a joint stock Company, to be called the "Commercial and Patriotic Association."

The Meeting appeared to concur generally in all that was proposed by the Chairman; but, Mr. Editor, there is a most important question I have to ask, and to which, I trust, some of your numerous and intelligent correspondents will oblige me with a satisfactory answer; as, before I take a share in this Association, I am desirous of knowing, whether the law, as it relates to unchartered joint stock Companies in England, is extended to this country? that is, if, by holding a share in this Association, I shall render myself liable to be called upon for the whole amount of the debts contracted by it, or only for such part as may bear proportion to the share I may hold?

I am, Sir,

Your obedient Servant,

Calcutta,
January 31st, 1828. }

E. B*.

* We cannot give a positive answer ourselves to the question of E. B.; but we suspect, that an unchartered Association of the kind proposed would be viewed in law as no more than a partnership, and liable, therefore, to the laws of partnership; according to which, the whole property of each individual would become liable to the debts of the Association. We would advise the Committee to obtain and publish Counsel's opinion on the subject.—ED*.

* The individual liability for the debts, or other pecuniary engagements of the Association, above referred to, is one which affects all agency houses, and all unchartered Associations like ours; but I would ask, whether a good and an important work is to be abandoned on this account? How do the agency houses in Calcutta stand? They are subject to the same liability; but their business is nevertheless conducted on the basis of mutual confidence; and might not we, with equal safety, have recourse to the same expedient?

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

Happening to be present at the Meeting yesterday, when the Commercial and Patriotic Association was formed, I felt surprised at observing this morning in your paper, by your correspondent E. B. that he was "one of the few" present. In reply, I have only to observe, that there were upwards of one hundred individuals present, all of whom seemed to take a lively interest in the proceedings of the day.

I am, Sir,

Your obedient Servant,

Calcutta,
1st February, 1828. }

W. D.

P. S. From so many East Indians being necessarily engaged in public offices, numbers were prevented from giving their attendance at the hour of meeting; and a gentleman present observed, that an evening Meeting would have secured an overflowing attendance*.

W. D.

Every thing will, of course, depend upon *good management*; and I would appeal to the candour of any one, whether we have not chosen among us "seven men of honest report," "whom we may appoint over this business?" Should, however, the known wickedness and dishonesty of a bad world, still operate as an objection, on general principles, the Committee now chosen will, I am sure, leave no stone unturned, to overcome every legal difficulty in the case; and a short lapse of time is all that is necessary for this purpose.—*Note by the Author.*

* This letter was sent by "W. D." to the Editor of the Bengal Hurkaru and Chronicle; but, as a place was not given to it in that paper, the writer afterwards handed it over to me for insertion in this pamphlet.—*Note by the Author.*

Editorial Remark in the John Bull of the 1st February, 1828.

A Meeting of East Indians took place yesterday, at the Exchange Rooms, to consider a proposal for establishing a Commercial and Patriotic Association; the objects of which were detailed, at some length, by a gentleman of the name of Ricketts.

Commercial and Patriotic Association.

A numerous Meeting of East Indians and others assembled at the Exchange, on the morning of Thursday the 31st ultimo, pursuant to advertisement, for the purpose of considering the propriety of forming a Commercial and Patriotic Association. Mr. J. W. Ricketts was called to the chair.

The following is the substance of the opening speech of the Chairman on the occasion, as reported by a gentleman present.

Mr. Ricketts began by expressing his thanks to the Meeting for having called him to fill the chair, which he considered as a proof of their trust, esteem, and confidence; and he begged them to exercise their forbearance towards him in the proceedings of the day. Before they entered on those proceedings, he read the advertisement convening the Meeting. The object, he stated, for which they had met, was to consider the propriety of forming a Commercial and Patriotic Association, on a large

scale, for the public good. His mind had long been occupied on this subject ; for, as a native of the soil of India, he had its welfare at heart ; and his family being, as it were, attached to the soil, afforded a sufficient pledge that he was only actuated in his exertions by a desire to produce public good. The case of the East Indian community he looked on as peculiar—nay, as desperate. This class had sprung up in the country within the last 50 years, and had, from a want of capital amongst them, been principally educated as penmen, and looked upon the public offices as their only means of support. But the public offices were unable, and would be unable, to provide for their families. They could hardly earn livelihoods for themselves ; and many amongst them had large families, without any prospect of providing for them. Some seven years ago, Mr. Ricketts stated, he took the first step to remedy this evil, by proposing the formation of a College, to educate young men for practical purposes. But his standard was too high for the state of things in the country ; and he lowered it two years afterwards, by proposing the establishment of a School, which proposition ended in the formation of the Parental Academic Institution ; and he was glad that he had taken in hand the matter of education, for the benefit of their children. He had lately been led to write a letter in the Hurkaru, in praise of education ; and, when he did so, he never thought he should sit down to write a second, and a third, ending in the proposition of a scheme like that now before them. Education was now provided for their young men ; but what prospect had

they of profitable employment for their talents? The public offices were literally crammed to excess, and could not afford employment for more than a limited number; and it hence became a question with him, what was to become of the increasing number of East Indians. He blessed God, that the scheme now submitted, had occurred to him; for he regarded it as a boon from Heaven to his countrymen. It was now only for them to make a beginning, on a small scale; and time would increase the value and extent of their undertaking.

Mr. Ricketts continued. He knew it was an opinion, amongst his countrymen, that Government would provide for them. But this was an erroneous idea; for Government had had a fair trial for the last 50 or 60 years, and what had it done? Why, as far as the Government were concerned, they were just where they were 50 or 60 years ago. The system of the Government was, in fact, against them. He did not make this observation, from any desire to bring the Government into disrespect; for, as a Christian, it was his duty to submit to "the powers which be, for they are of God;" but he was actuated by a proper sense of duty to his family, and to his countrymen. The subject of providing for East Indians, the descendants of British officers in the Bengal army, had occupied the mind of Colonel Kirkpatrick, when, in 1781 or 1782, he projected the Bengal Military Orphan Society, an Institution which would carry down his name, honoured and respected, to the latest posterity. But what was the origin of his scheme? Why, that the children of officers in this country should be li-

berally educated in England, and then sent out to India, to supply the places of their fathers. But this did not meet the approbation of the Court of Directors ; and they replied, “ You may set up a school, if you please, in Bengal ; but, as far as we are concerned, none of its wards shall set foot in England.”* This determination afforded a key to the policy of Government towards the class, who were to be benefited by the scheme now proposed. They had now formed a school for themselves—but still what had the Government done ? The managers of that school, in April 1826, had made an application to Government for pecuniary assistance, and received a dry official reply, declining to afford it. That application was renewed about a month ago, when Mr. Ricketts said he had an interview with Lord Amherst, who said to him, “ You will pardon me, Mr. Ricketts, if I do not give you a positive pledge of assistance from Government ; but, if you will state, in an official shape, what you have told me this

* With his wonted liberal-mindedness, Lord Hastings, during his late administration in India, uniformly manifested a strong desire to enlist the talents and qualifications of East Indians into the service of the State ; and the different local corps raised by him, during the late wars with the native powers, were almost exclusively officered by this interesting class. In this, however, his Lordship was repeatedly baffled by counter-orders from the Court of Directors, whose views on the subject did not altogether chime with such noble liberality ; so that, at length, the orders for disbanding the local corps became so peremptory, as to leave his Lordship without the power of acting otherwise than carrying them into effect.

After the disbanding of the different corps, an East Indian gentleman, who had belonged to one of them, waited upon Lord Hastings, to represent the hardship of the case ; when his Lordship told him, “ You see, Mr. ———, how matters stand. I have done my best to serve your class ; but the system makes against you. Had I retained you in the public service, after the last peremptory orders from England, I must have involved myself in a personal contest with the Court of Directors.”—*Note by the Author.*

morning, I will see what can be done." The application was accordingly made ; and he had heard only this morning, just before he came into the room, that it had failed also. He did not attribute its failure to his Lordship, who could not of course be held individually responsible for the acts of Government.

His countrymen, continued Mr. Ricketts, would now see, that the Government had had a fair trial, and that it had refused to recognize their claims on it. It said, " Do the best you can for yourselves ; but do not look to us for support." There was no doubt, Government could do as it pleased. There were no restraints, or restrictions, on it ; and it now only remained for his countrymen to make a bold effort to overcome the difficulties, by which they were surrounded, in their attempts to provide a remedy for the growing evil.

Mr. Ricketts here read several letters from different gentlemen, without mentioning their names, who had written to him on the subject of his scheme, since he first broached it in the *Hurkaru*, which were extremely encouraging.

He continued by stating, that he knew objections, strong objections, existed in the minds of many of the joint stock Companies ; and this feeling existed, because, in many instances in other countries, matters had been carried so far as to overdo the thing. But he challenged comparison between his scheme and any other in the world. Its principles were different from those of any other ; for its avowed object was to provide for a rising class of the community. It was, therefore, purely patriotic and philanthropic ; and these

characters, peculiar to it, would ensure the good conduct of those appointed to manage its details.

Editorial Remarks in the Bengal Hurkaru and Chronicle of the 2d February, 1828.

Our readers will find, in another column, the report of the proceedings at a Meeting held at the Exchange on Thursday. The Resolutions we published yesterday. While we differ from Mr. Ricketts, as to the advantages to be derived from his joint stock Association, we do cordially agree with him in the condemnation of that illiberal policy, which excludes his countrymen altogether from the civil and military offices of the State, however well qualified they may be, by worth and talent, to fill them, or however strong their claims of descent. If ever there was a period, in which such an invidious distinction could have been politic, at least it has already passed by; and we should hope, that the day is not far distant, when an entire change, in the system of administering this country, will altogether put an end to it. Instead of soliciting pecuniary aid, however, from the Government to their body, as a distinct class, either in plans of education, or Associations for the promotion of industry, the best boon the East Indians could ask of any Government here, we should think, would be to represent them truly to the Government at home, that the impolicy and injustice of these distinctions might be made manifest, and their abrogation hastened. For themselves, the most prudent course is,

we conceive, to avoid, as much as possible, what, in a familiar, but expressive phrase, is termed “ sticking out in the margin.” Let them be seen on all occasions mingling and amalgamating with their European brethren in the promotion of public objects ; so that their existence, as a separate body, may be forgotten. By descent, in principles, feelings, and language, they are Englishmen ; and, when we speak of an English public, we always include them.

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

I am fully aware, that the editorial remarks in your paper of this morning, relative to the ultimate tendency of the Commercial and Patriotic Association, are the real expression of your own views of the matter, and are meant to promote, as you conceive, the furtherance of the sacred ends of truth ; but, as they are, no doubt, liable to misconception in certain quarters, at least so far as I am concerned, and particularly at a distance from the scene of discussion, I think it right, now that my name is regularly come before the public, both in your paper, and in the John Bull, to offer a few explanatory observations in my own defence, and under my proper signature.

My object in devising the scheme of a “ Commercial and Patriotic Association,” is undoubtedly *not* to effect a separation between one class of the community and another ; but, *taking things, as they really exist*, over which I have no control, and not as I have made them, or shall

ever make them, I merely undertake the proposition of what I conceive to be an effectual remedy for the growing evil that surrounds us on every hand.

If any thing like a separation has been made between Europeans and East Indians, we owe it, in a great measure, to the system of policy, (right or wrong, I will not here stop to inquire,) observed by "the powers that be," in excluding the latter from the service of the State, without any moral fault or crime of their own. Hence, every appointment made by the authorities in England, which regards the admission of individuals into the service, who are resident in India, avowedly goes upon this *sine qua non* principle, "provided he is not the son of a native Indian."

Now it is not for me to quarrel with any one about this matter; but surely, when I see East Indians, (myself included,) thus thrown out of public favour and regard, as it were, by a mere stroke of the pen, and their prospects consequently circumscribed within very narrow limits, it is incumbent upon me, as upon every one else who has the welfare of the East Indian community at heart, to devise ways and means for opening new sources of livelihood for a prodigiously increasing class, who, if left to follow the beaten track of occupying situations in public offices, to the utter neglect of all other occupations in life, will, sooner or later, be reduced to such a state of desperation and distress, as even to resemble the land of potatoes, in the worst features of her case.

In my own view of the matter, the Commercial and Patriotic Association is admirably calculated, by the very

nature of its principles, to go a considerable way in providing a cure for the great mass of public evil to be overcome ; and I really cannot see, with all the optical powers at my command, how an exclusive separation will, or can be made between one class of the community and another, should even the utmost success attend our operations, under the Divine blessing ; since it can be easily shewn, that *none* are excluded from joining the Association ; but that, on the contrary, the cordial hand of fellowship is freely extended to *all*, whether Europeans or natives.

You will allow me to adduce a case in point. The Parental Academic Institution was formed on the 1st March 1823, precisely with the same primary object in view ; viz. the public good of the East Indian community ; but, now that it has been in operation for the last five years, I defy any one to prove that it has had the effect of separating the class, for whom it was more particularly intended, from their European or native brethren around them, any more than what was the real state of the case before the period referred to.

Clear-sighted, as you are, Mr. Editor, upon almost every subject, to which you bring the force of your editorial acumen, I am really surprised that you should entertain any fears of *our* separation from *you* ; but, Sir, I consider this very circumstance rather as a proof of *your* firm attachment to *us*, than as a successful exhibition of the truth.

All the good, or bad effect I hope to see produced from our Association, is a great share of moral, intellectual, and

commercial prosperity among the East Indian community, and their consequent elevation to the superior tone and standard of polished European society. This, so far from causing a separation, as you seem to dread the idea of, will, I am persuaded, draw the cords of union more closely together. Give us but time and space to work in ; and I am willing to put the matter to the sober test of experiment, divested of all speculative opinion.

While I am about it, Sir, with your leave, I will take this, I hope, the *last* opportunity to answer another species of objection that is coined by designing and evil-disposed persons. Without, of course, ever meaning to include *you* in the number, I know that there is a set of men, who, looking at the mere surface of things, are either weak or wicked enough to decry as *radicalism* every attempt made to promote the public good. Influenced, perhaps, themselves by selfish and groveling principles, they have no idea of what is meant by *public good*. Such a thing is not to be found in their vocabulary. Hence, whenever any plan, or scheme is broached for that specific object, apart from mere groveling selfishness, they are busy in raising a senseless clamour about radicalism*. Radicalism, according to their distorted acceptance of the term, is, I admit, an evil principle, and by no means to be defended ; but, if seeking the public good on a large scale be radicalism, I most willingly subscribe to the appellation ;—if the work of education, carried

* When I convened a Meeting at my house in South Colingah Street, on the 1st March 1823, to take into consideration the project of forming a public school, for the benefit of our rising community, we were branded as “ Colingah radicals” by a party, who were busy in their endeavours to frustrate our object, however laudable in itself.

on for the public benefit of the community, be radicalism, I glory in such radicalism;—if moral, intellectual, and commercial prosperity be radicalism, I am free to make the same avowal;—if the payment of duties and taxes levied on such prosperity be radicalism, I am sure that Government themselves would be the last to object to overflowing numbers in the list of radicals, on such terms. But, Sir, there is a glaring inconsistency in this. Only some few months ago, we were called radicals for *declining* to pay taxes. The present line of argument adopted by our Tauric scribblers, makes it out that we shall become such, the moment we *begin to pay* taxes.

What I have now said, will, I hope, serve, beyond its more immediate purpose, as an antidote against the poison continually vented forth in the pages of the John Bull, that known enemy to all public good, if we may judge from the testimony of his daily writings, who, though he made a wanton and unmerited attack upon me, as the author of the scheme for forming a “Commercial and Patriotic Association,” in an editorial paragraph in his paper of the 24th ultimo, absolutely refused me the common justice to republish, in the same columns in which the attack was made, the reply which I wrote in the Bengal Hurkaru and Chronicle of the following day.

I am, Sir,

Your obedient Servant,

JOHN W. RICKETTS.

2d February, 1828.

Editorial Remarks in the John Bull of the 2d February.

From the Resolutions passed at the Meeting at the Exchange, on the subject of a "*Commercial and Patriotic Association*," the "march of intellect" would appear to have wafted a bubble from the Exchange of London to that of Calcutta ; and such a bubble, in our honest estimation, that, even amidst all the wildness of speculation, which prevailed a short time ago in England, would not have lived there for a week. Were any man to subscribe one rupee under the scheme of this Commercio-Patriotic Association, we should think him fit for a strait waistcoat. Its "Projector" leaps at once over legal difficulties, at which a less sanguine personage would at least pause ; and seems to think it equally unnecessary to afford explanation, sufficient even to render his scheme intelligible to the public. If we can understand any thing of it, its distinguishing feature is, that there is to be no limit to its shares. Its capital may extend to crores of rupees ; and all that appears wanting, to give it consistency and effect, is a rule, that, so long as there are shares to dispose of, the share taken shall *not* be transferrable. In place of this, we have a most superlatively superfluous rule, that these shares may be transferred at the pleasure of the holders ; although it is obvious to the most common apprehension, that, if any man holding a share, wishes to transfer, it must be either from being tempted by a *premium*, or terrified by a *discount*. But how can a *premium* ever arise, where there is an inexhaustible stock of shares at *par* ? And what will be the effect of a *discount* on the shares purchased, upon the

shares in reserve? clearly that they must come down below *par*, or remain unsold! Such a ridiculous machinery altogether was never brought to the support of any Joint Stock Company in the world*.

To the Editor of the India Gazette.

SIR,

Since I have been at Calcutta, which is something more than ten years, I have observed the indefatigable exertions

* The Commercial and Patriotic Association is no "bubble," as the John Bull calls it. Difficulties may arise in our way; but I am yet to learn, whether "difficulties" are synonymous with "bubbles." The local Government found it difficult, legally so, to introduce the stamp tax into the City of Palaces, some few months ago; but, as the difficulty has now temporarily ceased, pending the result of our petition to Parliament, the stamp tax turns out to be no "bubble," at least for the present. The same reasoning applies to the case in hand. The John Bull, taking a pertinaciously distorted view of things, calls our Association a "bubble." Time will shew who is right, and who is wrong, in this matter. It will be for us never to lose sight of the all-important object we have undertaken; and, realizing the true grandeur of our work, let us fairly grapple with, and overcome each difficulty, as it rises before us.

There is nothing "superfluous," but all that is equitable, in the rule referred to, regarding the transfer of shares from one hand to another. The Bull overlooks the fact, that no share, once taken in the joint stock of the Association, can be again *withdrawn*, under any circumstances whatever; but, in order to accommodate individuals desirous of walking out of the concern, the very rule cavilled at by the Bull, expressly provides for the *transfer* of shares; so that a share-holder, thus circumstanced, has only to find another purchaser in his own room, which I conceive to be a law of perfect equity for all parties.

There is another point deserving notice. Quite versed, it would seem, in the stock-jobbing system, the Bull talks of "premiums," and "discounts," and so forth. His ideas cannot rise higher. Has the Bull so soon forgotten, that ours is a "Patriotic," as well as a "Commercial" Association; and that the invitation of "come and welcome" is addressed to all, who may be desirous of joining it? Why, then, should we make money, as it is called, by the levy of "premiums" and other fees on the admission of members? It is for this reason, that there is no limit assigned to the capital to be raised. All are invited to take shares at *prime cost*; and the pecuniary revenues of the Association, (not to mention other advantages of a superior order, such as affording suitable employment to the energies and talents of East-Indians,) are to be derived from the succeeding operations of actual business.—*Note by the Author.*

of Mr. John William Ricketts for the Indo-Britons. Indeed, Sir, it seems a matter of surprise to see the coolness, with which he is treated by his fellow-countrymen, the Indo-Britons, for whose welfare he endeavours his utmost efforts. Sir, reflect with what labour he founded the Parental Academic Institution, an Academy which will long be in reputation, and from whose walls many an enlightened hero is born, and holds honourable occupations at present; and there is no doubt some others will, in a short time, fill the vacant niches of orators and poets. Mr. J. W. Ricketts has endeavoured his utmost to meliorate the condition of his countrymen, and has given us sufficient proof of his patriotism. Although I am an European, yet I am impressed with a deep sense of gratitude to him; and I cannot conceive how the Indo-Britons could remain silent so long, without presenting Mr. J. W. Ricketts some token of respect and gratitude. Mr. Ricketts has not resigned his desire to make the Indo-Britons happy; but has founded, in addition to others, a "Commercial and Patriotic Association," to do good to his countrymen. The Meeting of this Society took place yesterday at the Exchange Rooms. But, leaving aside all these, (having transgressed too much on your patience,) I beg to hint, through the medium of your paper, to the Indo-Britons, and to tell them to raise a subscription to present some valuable and handsome token of their gratitude and respect to him; and I shall not fail to help them.

Well knowing, Sir, you will not refuse to insert this in one of the corners of your valuable paper, I have the plea-

sure to send you this ; and at the same time I beg you to insert it as soon as possible, and for which act of kindness,

I remain,

Sir,

Your obedient and humble Servant,

ONE WHO IS TO EMBARK FOR

Fairlie Place, } LONDON ON THE 25TH
Friday, February 1st, 1828. } FEBRUARY 1828.

To the Editor of the Bengal Hurkaru and Chronicle.

SIR,

As I am a perfect stranger to the John Bull, whether individually or editorially, and as his attack upon me arose entirely from my having broached a scheme in your paper, as I conceive, for the public good of an interesting branch of the community ; you will, I am persuaded, do me the *last* piece of common justice, which it is in your power to afford, touching this matter.

I am aware, Sir, that I have already trespassed upon your valuable columns, to an extent beyond what I could have reasonably expected ; but I now give you a positive pledge, now that I have real business of great importance to occupy my time and attention, that none of the future wild ravings of the Bull will again induce me to notice any thing coming from that quarter.

With this full and unreserved assurance on my part, I send you the subjoined papers, which will speak for themselves. I will observe, however, that, in addition to the

charge of *unfair dealing* carried to the highest perfection, in regard to the Bull's non-insertion of my replies in the same columns, in which his attacks are made, he stands guilty of a positive *breach of pledge*, as made by him through the lower branch of his office, in regard to his promised explanation in last Monday's paper.

I will also add, that, whilst thus unfairly keeping out all my replies from his paper, the Bull not only continues to write sneeringly in his editorial columns regarding my late scheme, but further readily admits the communications of correspondents on the same subject from other quarters.

Such is the Bull's servility to "the powers that be," (though even he can be a radical of *the first water*, when he chooses; that is, when the office of selling tape, wax, and gum is taken away from him,) that, had my scheme been but hatched in a Secretary's office under Government, I am sure he would have been the first to extol it up to the skies. His columns would have been made to ring with praises in its favour; but, as the scheme unhappily emanates from an *unofficial* quarter, it is every thing that is bad, or, to use his own words, it is perfect "nonsense and radicalism." How the noble cause of truth must be mangled and laid prostrate in such hands!

This exposure is, I think, but a simple act of justice due to the community, who will at once be enabled to form some idea of what sort of fair dealing they may expect at the hands of the Bull.

Whatever may be my other reflections on the subject, of this I am fully persuaded in my own mind, that the Bull is no real friend to the public welfare of India*.

I am, Sir, your obedient Servant,

LATE A MERE PROJECTOR.

4th February, 1828.

P. S. The Bull has even declined publishing the Resolutions passed at the Exchange Meeting, a copy of which I sent him, in common with all the other Editors.

Mr. Ricketts's compliments to the printer of the John Bull, and will thank him to insert the enclosed Notice in next Monday's paper.

Mr. R. will feel obliged by the printer's sending him a *proof*, when ready; or he will send for it himself, if the printer will mention the time.

26th January, 1828.

NOTICE.

The Editor of this paper, (the John Bull,) made a wanton and unmerited attack upon me, as the author of a certain scheme for forming a "Commercial and Patriotic Association," in an editorial paragraph inserted in his columns on Thursday the 24th instant; to which, I replied in the Bengal Hurkaru and Chronicle of the following day.

* After all, the Bull is but a mere "bird of passage," scraping together as much gold and silver as he can amass; and then he is off to Scotland, with "Adieu, India, for ever."

As the said Editor has not done me the common justice to republish my reply, in the same columns in which the attack was made, I think it sufficient to notify the circumstance in this way, for the information of his readers.

A MERE PROJECTOR.

26th January, 1828.

Mr. Ricketts's compliments to the printer of the *John Bull*, and will thank him to say when he may send to him for a *proof* of the Notice, which he sent this morning, for insertion in Monday's paper

26th January, 1828.

The printer of the *John Bull* returns the enclosed to Mr. Ricketts. The Notice, in its present form, he begs to say, cannot find admission in the *John Bull*. The printer is desired to say, that the Editor will have no objection to give a "Notice to Correspondents" on Monday, explaining*.

Saturday, 26th.

To the Editor of the John Bull.

SIR,

Our "Commercial and Patriotic Association" has been already formed on such a scale, as to call for our warmest gratitude to Him who is the true source of all success.

After this, Sir, I need not waste my energies to argue a point with you, or with any of your correspondents, one

* This was never done.

of whom appeared in your columns this morning; and, indeed, it would be derogatory to my principle to do so, after your unfairness in not republishing my reply from the Bengal Hurkaru and Chronicle, in the same columns in which your editorial attack was made on me in your paper of the 24th instant.

Now that my scheme has succeeded, I will subscribe myself,

LATE A MERE PROJECTOR.

31st January, 1828.

“Late a mere Projector’s” compliments to the Editor of the John Bull; and, as he would appear to be resolved not to publish any thing coming from him, will thank him to return his communication of the 31st ultimo.

2d February, 1828.

Editorial Remarks on the foregoing Papers, as contained in the Bengal Hurkaru and Chronicle of the 5th February 1828.

We have already more than once intimated, that we do not agree with Mr. Ricketts, as to the merits of his plan; and it is very possible, that, had we not been directly appealed to, we should have maintained silence respecting it, and have refrained from copying his letters, had they originally appeared in the pages of any other journal; but, as a matter of common justice and fair dealing, it was due to Mr. Ricketts, on the part of those who attacked his scheme, to insert his defence.

Editorial Remarks in the John Bull of the 6th February, 1828.

We seldom recollect a duller time in the world of politics, general or local; and, were it not for the rational recreation of the theatre, and the foolish palaverings of "Mere Projectors," our columns would present a most melancholy blank. We have often noticed the poverty of the City of Palaces, when its press is obliged to rely on its own resources for incidents and accidents; and we have seldom felt it more experimentally, than at present; nor did we ever more fervently pray for an arrival from England. We have been tantalized in this unpleasant predicament, by knowing, that our September periodicals were on board the *Perseverance*, but that she was sticking by the way up the river. At length, she is here; and we have now the consolation to be told, that, in order to lighten her, the intellectual cargo was shipped on board of some *Burns*, and they are slowly on their way to town. This is pleasant to those, who depend, so much as we do, on the BULLS, and BLACKWOODS, and REVIEWS of England. But we hope by to-morrow, to be able to enliven our columns with some more piquant articles on politics and trade, than we have, for some time past, succeeded in catering for them*.

* Such is the Bull's defence of himself against the double charge of "unfair dealing," and "breach of promise," laid at his door in my letter to the Editor of the Bengal Hurkaru and Chronicle of the 4th February!!!—*Note by the Author.*

*Editorial Remarks in the India Gazette of the 7th
February, 1828.*

Whether the project of the Commercial and Patriotic Association shall eventually succeed or not, we are free to confess, that those who have taken so much trouble in endeavouring to give it practical shape and effect, appear to us to deserve well of the community.

Difficulties may arise in the path of this Joint Stock Association ; but, at any rate, it is some merit to attempt well in a good cause. It is even a great object gained, when men evince a readiness to meet and consult together, and to frame public-spirited plans. Formerly, the complaint was, that the East Indians were apparently at a dead halt of apathy, that individual self was all in all, and that there was no general feeling or sentiment of coalescing common interests. Within these two or three years, much has been done to wipe away a reproach, that to reiterate now would be most unjust. Rome was not built in a day,—nor is the task of regenerating classes of men, the work of a week. When, however, the earnest desire of improvement becomes a general principle, the spirit soon acquires an impetus that cannot fail in the long run to ensure success.

As the first step to amendment is a deep sense of error ; so is the first step in social and political advancement, the general consciousness of being in a “ false position.” We are exceedingly thankful to the Duke of Wellington for the invention of a phrase, which so correctly characterizes the situation of the class we allude to.

To the operation of the improving spirit, which has assuredly commenced its active and beneficent influence, we already owe the Parental Academic Institution ; and it is not speculating too much to suppose, that that Institution is daily calling into action energies and feelings that would otherwise slumber ; so much does a desire to advance in the moral scale depend upon the lights of education, which form such a favourite subject for the derision of the scorner, and such a hateful one for the jealousy of the despot.

Conscious that their cause is just, and their objects laudable, we would therefore suggest to those who have been influential in forming the Commercial and Patriotic Association, to proceed perseveringly in their endeavours to ameliorate the condition of their fellow-countrymen ; but not to be too hasty, and, although they may meet with unforeseen difficulties, not to despond : since the materials, upon which they have to work, are daily becoming more abundant, and more capable of beneficial elaboration.

To the Editor of the John Bull.

MR. EDITOR,

I hope I don't intrude ; but going the other day past the Exchange, on my way to Mortimer's, I popt in, as there were two or three square boxes and drags at the door, thinking I might get a bargain or so : but the Durwan said there was no sale, but a "*burra tumasha*" up stairs. Couldn't miss it—what an opportunity ! got the Gazette. Public Meeting. Doors to open at nine : curtain to draw up at 11 precisely : bit of a farce, perhaps, thought

I—free admission—capital ! peeled my pea green ; nobody knew me, quite welcome : hand of fellowship—more free that, than otherwise—bought a bill of the play ; paid a rupee—bad bargainish ! Couldn't make it out—quotations from the Bible—" take care of those of our own household"—Mem : No 1—made out that.—Play began—enter queer little man with sharp nose—put him in the chair : Mem : make good Guy Faux, change gunpowder plot to the happy 31st January. Resolved nem-con : make indigo, sugar, saltpetre : joint stock—stray bubble from Stock Exchange—was not to be had—burnt my fingers in the Calorifico-Frigorific Society—forced to fork out 2,000 in that—gained a loss—never venture again.—Saw my chum—asked his opinion : Mem : Ned's a lawyer—couldn't be mistaken : shook his knowledge box for half an hour—thought it would come off—but didn't—said, was unchartered Association : members liable to the uttermost cawrie of their private fortunes—Mem : view of No. 1. Chowringhee : trotted down stairs : went to auction : didn't know me : bought a palanquin : a bargain—got in : put on my pea green—forgot my umbrella : went to look for it—bearers ran away with my palkee : misfortunes never come single : walked over to Mortimer's—took a drop of his No. 1—got fuddled—thought of taking a share : man in black coat told me, I deserved a strait waistcoat, if I did so—Mem : Mr. Beardsmore's sky parlour—second thoughts are best.

PAUL PRY AMONG THE PATRIOTICS*.

* This letter from a correspondent in the John Bull, is altogether unworthy of notice. Upon his own shewing, " Paul Pry" relinquished

Editorial Remarks in the John Bull of the 9th February, 1828.

It may probably amuse the readers of the John Bull to see the terms, in which our contemporary of the India Gazette has spoken of the Commercial and Patriotic Association, of which we have already delivered our opinion ; and we extract it, for their perusal. It is, perhaps, after all, a happy temperament that leads one to see great good ultimately resulting out of what, in itself, must be allowed to be rather trifling. but we are so unhappily constituted, that, with all our anxiety to see this Association in the light, in which it is viewed by the Gazette, we cannot recognize in it the nucleus of any great good to the East Indian community. We venture to prophesy, that it will very soon cease to be heard of, unless its support is taken up by those of this community, who have judgment to place it on something like an intelligible and practical basis, and influence to carry it on, when so placed. The absence of this part of the East Indian community, at the late meeting at the Exchange Rooms, and the manner in which we understand they stand aloof from its promoters, give no great promise of ultimate success to the Association, were it even in itself more entitled to public countenance, than it is. The India Gazette observes :

his patriotism for a strong glass of brandy and water ; and, in stating the fact, he would appear to labour under a mistake as to the *time of day*, in which he thus indulged himself. Judging only from one circumstance, I am inclined to think that he must have " got fuddled," as he says, *before* he came to the Meeting, as well as *after* he left it ; or else how came he to manufacture " a sharp nose" for the " queer little man, who was put into the chair" on the occasion ? — *Note by the Author.*

“ Whether the project of the Commercial and Patriotic Association shall eventually succeed or not, we are free to confess, that those who have taken so much trouble in endeavouring to give it practical shape and effect, appear to us to deserve well of the community.

“ Difficulties may arise in the path of this Joint Stock Association ; but, at any rate, it is some merit to attempt well in a good cause. It is even a great object gained, when men evince a readiness to meet and consult together, and to frame public-spirited plans. Formerly, the complaint was, that the East Indians were apparently at a dead halt of apathy—that individual self was all in all, and that there was no general feeling or sentiment of coalescing common interests. Within these two or three years, much has been done to wipe away a reproach, that to reiterate now would be most unjust. Rome was not built in a day, nor is the task of regenerating classes of men the work of a week. When, however, the earnest desire of improvement becomes a general principle, the spirit soon acquires an impetus, that cannot fail, in the long run, to ensure success.

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“ To the operation of the improving spirit, which has assuredly commenced its active and beneficent influence, we already owe the Parental Academic Institution ; and it is not speculating too much to suppose, that that Institution is daily calling into action energies and feelings that would otherwise slumber ; so much does a desire to advance in the moral scale depend upon the lights of education, which form such a favourite subject for the derision of the scorner, and such a hateful one for the jealousy of the despot.

“ Conscious that their cause is just, and their objects laudable, we would, therefore, suggest to those who have been influential in forming the Commercial and Patriotic Association, to proceed perseveringly in their endeavours to ameliorate the condition of their fellow-countrymen ; but not to be too hasty—and, although they may meet with unforeseen difficulties, not to despond ; since the materials, upon which they have to work, are daily becoming more abundant, and more capable of beneficial elaboration.”*

*The public are now invited to see, at one point of view, the striking contrast Nature has so wisely put between “ liberal-mindedness” and “ narrow-mindedness,” between “ wilful blindness” and “ a generous openness, to conviction,” between “ rank prejudice” and “ a freedom from rank prejudice !” Two Editors are now fairly brought together, within a narrow compass. Let us look at the face of the one, and then of the other ; and the contrast thus drawn, will at once shew the distinctive features of each character.

The Bull talks of another monopoly of “ judgment” and “ influence.” Instead of sending a deputation to the Exchange Meeting on the 31st ultimo, I wish his Tauric majesty had at once favoured us with his own presence, and actually named the individuals, who, in his opinion, thus engross to themselves qualities necessary “ to place our Association on something like an intelligible and practical basis, and to carry it on, when so placed.” As it is, we are unhappily left to grapple with a mere shadow, thrown out from a dark and mysterious allusion, perhaps unintelligible to the writer himself. This is surely not the way to place things “ on an intelligible and practical basis.”

To “ engage in the wide field of agriculture, trade, and commerce,” as a primary and leading object ; to “ watch over, and promote by every legitimate means in our power, the real welfare and interests of the East Indian branch of the rising generation around us,” as a secondary and ulterior object ; and to “ promote the work of sound and wholesome education among the native population, and introduce a spirit of general improvement into all the available resources of the country around us, on such a scale as circumstances touching our financial prosperity may warrant,” as another secondary and ulterior object, constitute, in the mind of the Bull, a formidable class of “ impracticables,” not to be overcome even by the united aid of energy and perseverance. And why so ? The plain and unanswerable reason, is, that he has never yet himself engaged in such pursuits, since the setting up of his paper in 1821.—*Note by the Author.*

Commercial and Patriotic Association.

To be published on the 20th February, A Series of correspondence, and other matter, that has appeared through the medium of the public press, regarding a certain scheme for forming a "Commercial and Patriotic Association," avowedly for the public good of the East Indian community, with a dedication to the Honorable the Court of Directors of a Company of Merchants of England trading to the East Indies. By John W. Ricketts. Price, three Sicca Rupees.

N. B. Any profit accruing from the sale of this work, will be made over to the Parental Academic Institution*.

4th February, 1828.

Editorial Remarks in the John Bull of the 11th February, 1828.

We observe a notice of the intended publication of "A series of correspondence, and other matter, that has appeared through the medium of the public press, regarding a certain scheme for forming a Commercial and Patriotic Association." There is an old advice found in some of our plays—"keep moving," "keep moving," of which it seems our Commercial Patriots are determined not to lose sight. Encouraged by the *very favourable* reception of

* This Advertisement ought, strictly speaking, to have been inserted in the order of time, in which it was published in the newspapers; but, perhaps, its juxtaposition to the editorial article from the Bull is rather an advantage than otherwise.—*Note by the Author.*

the scheme from the public at large, and the praise bestowed on it, in particular, by the India Gazette, the Projector has now taken a higher flight, and announces the dedication of this interesting production to "the Honourable the Court of Directors of a Company of Merchants of England, trading to the East Indies." In general, dedicators employ the phraseology of respect towards their chosen patrons; but "*a Company of Merchants,*" &c. appears to us more like one of contempt; but, perhaps, we are hyper-critical in saying so*.

* It is rather singular, that, when East Indians remain stationary in one position, they are stigmatised as a worthless and degraded race, wanting energy and spirit for any important undertaking. The moment, however, that they begin to bestir themselves, they have to contend with an opponent on the other tack. The phrase, "*keep moving,*" "*keep moving,*" taken from one of the Reverend Editor's plays, ("*our plays,*") is employed as a sneer to dishearten them in their exertions. So much for consistency!

"The praise bestowed on my scheme by the India Gazette," was conveyed in an editorial article in the paper of the *seventh* February; whilst my Advertisement, regarding the dedication of my work to the Court of Directors, is dated the *fourth*! How the *former* could have had any influence on the *latter*, is left for the Bull's logical powers to decide.

The Bull objects to my designation of the East India Company, as "*a Company of Merchants of England trading to the East Indies.*" I am aware, that the *complimentary* way of designating them, is, "The Honourable East India Company," since they are "all honourable men;" but my business just now is not with compliments, but with the real truth of the case; and I have adopted that very designation, the legal one, under which they hold their charter of this our Eastern empire. In adopting *complimentary* designations, I may possibly have erred, through an excess of flattery; but, in adopting a *legal* one, sanctioned by the Legislature in England, I cannot ever be mistaken. Complimentary expressions are necessarily transient, and contemporary only with the transient circumstances which give them birth. If the East India Company's charter were to expire to-morrow, without being renewed for another lease, I am sure the Bull would be the last to spend his breath, or to write his pen down to a stump, in the office of advocate for that commercial body. On the other hand, legal designations are not only both correct and permanent in themselves, but also more

A CARD.

Mr. J. W. Ricketts presents his compliments to the writer of a letter in the India Gazette of Monday, the 4th instant, signed "One who is to embark for London on the 25th February 1828," and would be very happy to have the pleasure of an interview with him ; as he is desirous of seeing him on some particular business, before he goes.

A line privately addressed by him to the care of the Editor of the India Gazette, will reach Mr. R.

11th February, 1828.

*Editorial Remark in the Madras Courier of the 1st
February 1828.*

The subjoined paper* appears in the Hurkaru of the 18th ultimo ; and we would recommend the attention of

likely to survive the changes and revolutions of time, reaching even to the distant ages of posterity.

Since writing the above, it has, I think, occurred to me what the Bull is driving at. I see, that even he is sometimes *waggishly* inclined, at the expense of his "honorable masters." He would seem evidently to have, in his mind's eye, the well-known story of a poor Company's pen-knife, branded with four letters just sufficient to make up the word "VICE." To complete this character, the Bull would have me lop off the indefinite article "a," and fill up the hiatus by substituting the definite article and participial adjective, "The United." Well, let it be so ; since this is only making a legal designation more complete in all its parts. I have accordingly made a corresponding alteration in my "Dedication" to the Court of Directors ; but it so happens, that I am too late for rectifying the title-page, which has been already struck off. For this, however, I must beg pardon of "The John Bull in the East," and of each and every honest Member of "The United Company of Merchants of England trading to the East Indies." By the by, "Union is strength," which reminds me of the expediency of calling in the aid of such a principle into our "Commercial and Patriotic Association."—*Note by the Author.*

* Referring to the preface to the first edition of my pamphlet.—*Note by the Author.*

that class of our readers, called Indo-Britons, to the pamphlet to which it alludes.

CONCLUSION.

Under this head, I think it necessary to say a few words; and they will be but a few words.

All the *pros* and *cons* on both sides of the question regarding my scheme, have now been faithfully given, as extracted from the columns of the Bengal Hurkaru and Chronicle, the India Gazette, and the John Bull. The only other newspaper in Calcutta, the Government Gazette, has studiously maintained all the inviolability of a sort of dignified silence on the subject; so that I have been spared the thankless office of ransacking its files for the extraction of matter for my pamphlet, as in the case of the other three.

As I was under a positive pledge to the Editor of the Bengal Hurkaru and Chronicle, to say nothing more on the subject of my scheme, through the channel of his paper, having already occupied so much space in his columns from day to day; and as the Editor of the John Bull absolutely declined publishing any communication coming from me, though he scrupled not at the same time to indulge his correspondents on the other side of the question; now that I am in my own empire, free from all such shackles and restraints, I have thought it right to subjoin a few ideas, in the way of explanatory notes, to the different articles, which appeared to me to need any thing like replies.

To speak candidly, the editorial article taken from the India Gazette of the 7th February, and inserted at page 86 of this pamphlet, appears to me, if I may be allowed to offer my judgment, to be the best of the whole, as approaching nearest to the standard of truth upon the subject; and I take this opportunity publicly to thank the Editor of that paper, for the equally sound and philosophical view, which he has at once taken of the matter.

An objection has been made by some to the use of the word "Patriotic," as employed in the designation of the Association. To lop off an explicative term, betokening a worthy principle, and big with important signification, would, in my opinion, be to reduce the Association to the level of a mere *commercial* undertaking, calculated in every way to degrade the subject. It is the *patriotic*, or *philanthropic* part of the scheme, that sheds a lustre of superior interest and dignity over the whole. When I first proposed the word "Parental" for our school, about five years ago, it is fresh in my recollection, that precisely a similar objection was made, which was afterwards overruled by an explanation on my part to the following effect; viz. that the design of a public school, as projected by me, emanated from the force of parental feelings brought to bear upon the subject, and that the Institution under contemplation would consequently be an Institution of parents and guardians, who felt an ardent desire to promote the sound and wholesome education of their children and wards.

The same explanation, but only varied in words, will perhaps suffice for the present case. The scheme of a

“ Commercial and Patriotic Association,” emanates from the proper influence of sound patriotic principles ; and the Association will consequently be an Association of those, who aim at the public good of the particular class, (without, however, excluding others,) for whom it is avowedly designed.

To keep the fundamental principles of an undertaking in the back ground, and prominently to substitute something else in their room, is, in my opinion, a species of unworthy duplicity, which ought not to be tolerated, for a moment, in any honest, civilized society. India, even in its present *unimproved* condition, has been often exultingly called “ the brightest gem in the British crown ;” and, if, by our patriotic, or philanthropic exertions for the public good, we succeed ultimately in imparting to this “ gem” a higher polish, and a more vivid brightness, we shall most assuredly reap to ourselves a just title to the praise and gratitude of the “ crown,” in which it is set.



No. 7.

“ I have the pleasure to send you herewith one rupee for one copy of your ‘ Proposals.’ The other four copies I shall endeavour to sell for you, but I doubt whether I shall be successful. For I know, from my own experience, that, though people are very ready to receive whatever is given them *gratis*, they are very reluctant to *pay* even but one rupee for any literary performance.

“ As to your design in this publication, I believe it is very good ; but you seem to me to recommend only a palliative, which, as all other palliatives, will, in the end, do more harm than good. I have not yet seen any proposal, which appeared to me to meet the case of the Indo-Britons, (East Indians, Eurasians, or whatever term you prefer,) fairly, except Mr. Kyd’s recommendation, which was so ably recommended by Dr. Marshman in the *Friend of India*.”

22d January, 1828.

No. 8.

“ If you have reason to expect, that your called Meeting will be attended by a sufficient number of persons, I will thank you to inform me. I conclude you have received the promises of many of our countrymen on the occasion ; but I wish to know how the case stands. Let not the vile Bull have ground for malicious exultation.”

26th February, 1828.

No. 9.

“ I have put down my name for one copy. But I hope you will excuse my candour in telling you, that I have done so, in the expectation, that this new publication will contain, what the ‘ Proposals’ did not, viz. the objections which have been made

against your scheme by its opponents, which, I confess, appears to me unanswerable."

9th February, 1828.

No. 10.

"I should with pleasure put my name down as a Subscriber to your intended publication, were it not that my very limited circumstances at present prevent me from doing so. I trust you will not consider my refusal as any dislike to the publication; for I am inclined to think it will be of service to the community in general."

20th February, 1828.

No. 11.

"Mr. — would be happy to subscribe; but he really has not to spare for the purpose. His compliments to Mr. Ricketts*."

21st February, 1828.

* As a general thing, I sent one of my subscription books for this pamphlet to a certain personage, whose name need not here be mentioned. Instead, however, of remaining silent about the matter, or simply declining to subscribe, he gratuitously took it upon himself to say, that, "disapproving altogether of my scheme, he would not identify himself with it in any way whatever," or something to that effect. A truly loyal resolve, no doubt! As I destroyed his note, in the hurry of the moment, when I received it, I have now, upon second thoughts, given the full and true purport of it; lest the worthy author should ever have room to say, that I did not do him the common justice to place him in the ranks of the enemy, to which he seems so proud to belong.—*Note by the Author.*

APPENDIX.

*Private Communications received by the Author, on both
Sides of the Question.*

No. 1.

“Are you ‘A mere Projector?’ &c. If you are, you have my best wishes ; and I will enter into your scheme.”

18th January, 1828.

No. 2.

“I have read your letters in the Hurkaru, with some interest ; for it is certainly important to parents, having families that may not quit this country, to see sources of employment springing up for the vast and daily increasing population, (descendants of Europeans.)

“I am afraid I shall not be able to sell any of the pamphlets, but have taken three ; for which, I send the price ; if I should require more, I will send to you.”

Monday.

No. 3.

“Please to accept of my sincere thanks for the pamphlet, which you have kindly sent me. Wishing you all prosperity in your philanthropic plans, I subscribe myself,” &c.

Monday afternoon.

No. 4.

“I have received the copy of the pamphlet, which you did me the favour to send ; and shall peruse it at the first leisure moment.

“ In general, I would give my warmest support to any plan, which would tend to promote the increase and honourable employment, in the interior, of a British-descended population, and particularly that class, which is at present so unjustly and jealously excluded by the present Government from offices and employments of trust and honour ; but I have a strong dislike to Joint Stock Companies, and think them bad engines in any pecuniary undertaking.”

January 19th, 1828.

No. 5.

“ I thank you for your attention in sending me a copy of your ‘Proposals.’ I read the letters, as published in the Hurkaru newspaper, with much interest. Whether your project, modified, or as originally planned, shall be put into execution, nay, even though it should remain wholly inoperative, you certainly deserve well of your fellow-countrymen, for suggesting a mode in which talent, energy, and capital, under the controul of reason and moderation, may be lawfully exercised, and successfully applied.

“ Apathy, evinced in a supine adherence to one almost exclusive employment for obtaining a livelihood, is the chief enemy, with which the large and increasing class of Indo-Britons has to contend. I can honestly say, that I shall be happy to see them extend their views in any proper manner, calculated to add to their reputation, honour, and fortune.”

Monday, 21st January, 1828.

No. 6.

“ I fear I shall be rather late in the market ; for the pamphlet is already in the hands of most of my friends ; however, I will do my best to dispose of them. The proposed scheme has my best wishes for its success ; and I should gladly have joined in it, if my means admitted.”

21st January, 1828.

PROSPECTUS

OF THE

INDIAN COPPER MINING COMPANY,

HAVING A RESERVED CAPITAL OF

400,000 *Madras Rupees.*



Applications for Shares in this Company to be made personally, or by letters post paid, to Messrs. E. S. MOORAT and Co., Agents of the Company at Madras, or to Messrs. BAILLIE and MOLLOY, Solicitors of the Company, Calcutta.

THE INDIAN COPPER MINING COMPANY,

UNDER THE SIGNATURE OF
DE FONDCLAIR AND CO.

Established 11th day of April, 1835,

For the purpose of working the Mines of Copper Ore in the Districts of Nellore and Cuddapah, and in the Zemindaries of Calastray, Vencatagherry, and Udagherry ; with

A reserved Capital of 400,000 Madras Rupees.

Directors.

1. Edward Samuel Moorat, Esquire.
2. Claudius Augustus Kerr, Esquire.
3. Faure De Fondclair, Esquire.
4. John Maccandy Campbell, Esquire.

Agents.

Messrs. E. S. Moorat and Co. of Madras.

Treasurers.

Government Bank.

Solicitors of the Company in Calcutta.

Messrs. Baillie and Molloy.

The Ores of Copper which this Company propose mining for are situated in the Nellore and Cuddapah districts ; the mines already opened are in Nellore ; the depth of the largest mine is 50 feet.

The ore which has been obtained in quantity is denominated the “ *Anhydrous carbonate of copper,*” by Thomas Thompson, M. D., F. R. S., E., and is a *new species of copper ore* ; but rich sulphurets have just been discovered.

By Dr. Thompson’s analysis, the ore is composed as follows :

Carbonic acid,	16·70
Peroxide of copper,	60·75
Peroxide of iron,	19·50
Silica,	2·10
Loss,	·95

The Company have the exclusive privilege of mining in the lands of the Zemindars of Calastry, Vencatagherry, and Udygherry, for 21 years*, and also have the grant of a lease for 21 years, of all the mines of copper ore in the Talooks of Duppaud, Cummum, Giddalore, and Budwail, in the district of Cuddapah; and Callagherry, Caval, Duttalore, and Buddapoody, in the district of Nellore, from the Madras Government, with a preference of renewal for a further term of 21 years, on certain conditions, and an exemption from duty or impost on the produce of the mines, for the period of ten years; and also an exemption from duty on the machinery, timber, and stores imported for the works.

These ores are remarkable, first, for their richness; secondly, for their freedom from all noxious matter; thirdly; for their easy reduction on a single smelting; fourthly, for their appearance on the surface "*in force*," requiring only (so far as the work has hitherto progressed) labor open to-day, and rendering their acquisition immediate, at a trifling incipient outlay.

The ores that have been obtained hitherto in the surveys of the country "have been carbonates of copper;" but latterly sulphurets have been discovered in three different mines.

The "*Anhydrous carbonate of copper*," "*Malachite*," and "*Mountain green*," were the ores known to exist; these ores crop the ground over an immense extent of country, and veins on the surface are abundant.

The distance of the mines that have been worked from the sea coast is about 40 miles. Timber and charcoal, to any extent, are procurable in the Nullah Mullay range of mountains to the west, distant about 40 miles; and the carriage of both to the works, on the (*Woodiwar*) country bandy will be a trifle, say three rupees a ton.

The ore has been proved to be in *veins*, as well as *nests*; the former in granite, greenstone, and also in clay-slate; the springs are not copious, and no obstacle worthy remark appears to embarrass the undertaking.

per cent. of copper. The picked ore averaging more than 45 per cent.; but the average yield has been set down at 40 per cent.; as it is almost impossible totally to divest the picked ore of the adhering quartz, or other matrix; the picked ore is estimated at £40 per ton, the metal at £120.

On comparing the prospects that encourage the present mining undertaking with those that exist in Cornwall and Wales, the advantages in favor of the Association are very great.

The yield of the Cornwall and Welch ores (sulphurets) is only from 5 to 9 per cent. Those of Nellore give an average yield of 40 per cent.

The Cornwall ores sell at the hammer at the mine head, on an average, for one pound sterling per cent. of metal in the ore, i. e. ores containing 5 per cent. metal, sell for £5; 6 per cent. metal for £6, and so on. The Nellore ore at this low estimate, yielding 40 per cent. metal, must bring £40 a ton.

The sulphuret of Cornwall is taken to Wales, and there smelted, and some batches of ore require 15 processes of refinement (*all furnace work*) before the metal becomes marketable copper.

The Nellore ores are reduced by a single smelting.

The sulphuret of Cornwall produces an impure metal not ductile.

The Nellore metal can be drawn into the finest wire; is applicable to all mint purposes, and is also suitable for *jewellers' alloys*.

The Cornwall ore is found at a depth of between 1,800 and 3,000 feet.

That of Nellore is found in veins on the surface, which increase in size and thickness as they dip, and all the ore yet obtained, has been raised from within 50 feet *of the surface*.

The establishment and expences attendant on the deep mines of Cornwall involve serious risk and outlay.

The (comparatively speaking) superficial work at the Nellore mines, in a country where labour is so cheap, must cost

The Company is divided into shares, each share being of the value of 5,000 Madras Rupees; but in order to suit public convenience, it is proposed, that parties desirous of purchasing an *Interest* in the undertaking may hold so small an interest as a fifth part of a share, paying for such fifth part 1,000 Madras Rupees, provided the number of shares that offer, recommend the measure, and that it receives the consent of the Directors.

The Deed of the Company will be open for the perusal of intending purchasers of Shares or *Interests* at the Office of the Agents of the Company.

The share-holders shall vote at all general and annual meetings, and in all matters relating to the Company: the holder of one share shall be entitled to have one vote or voice at general and annual meetings; those holding four shares, to two votes; eight shares, to three votes; twelve shares, to four votes; and fifteen shares, to five votes; and no individual share-holder is to have more than five votes in the affairs of the Company. To entitle a share-holder to vote in the affairs of the Company, such share-holder must have an interest in the Company to the extent of M. Rs. 5,000, i. e. a full share; but all parties holding an *Interest* in the Company are entitled to attend the general and annual meetings of the Company, and to speak on the affairs of the Company at any such meeting.

As between themselves, the share-holders of the Company shall not be liable for the debts due by the Company beyond their respective shares and Interests therein.

One-third of the profits of the Company to go annually towards the formation of the reserve fund, of 400,000 Rupees, the remaining two-thirds to go to the share-holders.

On the 1st of January of every year, a general account and rest shall be made, and taken by the Directors of the affairs of the Company, and such shall be open for the examination of the share-holders, for two calendar months then next ensuing.

The books of the Company shall be exposed, every three months, at the office of the Company, for thirty days, for the inspection of the share-holders.

All dividends shall be payable at the office of the company in Madras twenty-one days after having been declared, and all such shall be so declared in the month of January in every year.

The share-holders are not liable for any further calls beyond the amount of their subscribed shares ; but no transfer of shares can take place, without the sanction of the Board of Directors being first obtained, and the Directors are not liable to be called on for their grounds of refusal.

The Directors of the Company have applied to the Council of India for a charter to incorporate their body.

No new rules, orders, or regulations made by the Directors shall be considered as confirmed, if on being read at the first general meeting that takes place after such having passed the Direction, they be objected to by a majority of the votes of two-thirds of the share-holders, within forty-five days after being so read.

Applications for Shares or Interests in the Company to be made personally, or by letter postpaid, to Messrs. Baillie and Molloy, Solicitors to the Company in Calcutta, or to Messrs. E. S. Moorat and Co. the agents of the Company at Madras.

ANALYSIS OF THE ORES FOUND WITHIN THE LANDS IN GRANT TO THE COMPANY.

[Extracted from the Journal of the Asiatic Society. Oct. 1835.]

Through the kindness of Mr. C. A. KERR, I have had a further opportunity of examining the produce of the Nellore copper mines, of which cabinet specimens were presented to the Asiatic Society two years ago*, before the formation of the "*Indian Copper Mining Company*" at Madras, for the purpose of turning to profit the mineral stores of this promising district.

From a pamphlet published at Madras, we learn that the copper mines in the Nellore and Cuddapah districts were discovered about 40 years ago, by Mr. BENJAMIN HAYNE, whose report to Government, inserted in his *Tracts on India*, gives the fullest and most satisfactory account of them. From this pamphlet, we glean the following particulars of the locality, and of the quality of the ore.

"The districts on the coast in which copper ores have been discovered are those of the Calastry and Vencatagerry zemindaries and the Udygherry Jaghire, in the zillahs of Nellore and Duppah and other places in the ceded districts.

"The principal mining places are at the distance of about 30 miles N. W. from Nellore, 30 miles from the sea, about the latitude of Rāmapatam, and about 40 miles N. E. from Cuddapah.

"Several rivers run right through it on their way to the sea from the western hills, of which the Pillapeyeroo, Vuppovagoo, and Manyroo form a junction not far from Guramapenta, the principal mining place, and form a pretty large river, which is said to have a good deal of water throughout the year. Its beds are very stony, which seems in the eyes of the natives the greatest objection against its being made navigable for boats: it deserves therefore an accurate survey.

"The general aspect of the country is barren, and uncomfortable in the extreme: large trees are only found in and near the villages; and on the wide extended plains, on both sides of the river, nothing encounters the eye, but here and there a small thorny shrub. The grass, which, in the rainy season, every where else carpets the country with a refreshing green, is here both scanty and of the poorest kind, a species of "*aristida*," which, as the name implies, is a compound of long beards or bristles. This is the case in most mining countries; the surface of the soil contains in many places so much salt, that the inhabitants could make enough, if allowed to do so, for their own consumption.

"To the eastward, the country is open; only here and there a few low hills are to be seen; but to the westward, there are ranges of hills, the nearest at the distance of about 10 miles. Due west is one called Malla-coudah, from being the highest hill in the range. It is said to abound with wood. The Udygherry mountains are to the south-west, about 16 miles, and the highest in this part of the country: the highest point I take to be about 3000 feet above the level of

* See Proceedings of the Asiatic Society, Feb. 1833, in vol. ii. p. 95.

the low country : I have seen myself, that plenty and large wood grows there, particularly between the valleys.

"About 20 miles on the way to the sea, in the direction of Rāmapatam, are extensive jungles, consisting of—1. Korra, *Panicum italicum*, L. 2. Aruga, *Paspalum tomentacium*, L. 3. Woolava, *Glycine tomentosa*, L.

"This country is, geologically speaking, of a primitive description ; the general rock formation is a mica-slate, of different colors and consistence. It shews itself first in the low country, at the distance of about 15 miles east from the hills ; it forms sloping mountains, which are often capped with horn-stone slate, which passes into sand-stone, and on the other hand, into jasper. The tabular summits and mural precipices of the Udygherry hills consist of the latter stone kind : the layers or strata of the mica-slate occur in different positions, and inclination to the horizon ; often in the low country forming a right angle with it ; on and about the Udygherry hills, the strata appears in the utmost confusion, as if thrust by force out of their proper position. Traces of copper ores are often found in this rock, and it is generally known to contain various metallic veins, as gold, silver, and copper.

"Subordinate to the former is green-stone slate, in mighty layers, often as to appearance constituting the principal rock of a district for many miles. This is the case about Guṛamanypenta and the other mining places. The layers or stratification of the latter rock I have as yet always found in a horizontal position.

"The green-stone slate is often approaching to green-stone ; it occurs then only obscurely slaty, has a jet black color, strong glossy lustre, foliated fracture, hard in a small degree ; in this state it seems here barren of metals of any kind. The real green-stone slate is of a bluish black color, with small white spots of decomposed felspar, half hard ; and when exposed to the air, it crumbles soon to pieces, and takes a green color. The rock is reckoned one of the richest '*mothers of ores*' of any in the world. In it are found silver and copper in rich beds or layers, as is the case here ; but never in veins, as in other formations*.

"The layers of copper are of different thickness, and distances from each other : the general run of the pieces of ore, constituting the layers, is two inches in thickness ; but they have been found also of several feet. The pieces are in general flat, as if compressed, and coated with ochre. The vertical distance between the layers is 4 to 8 feet, and the horizontal is even more uncertain.

"A corroded honey-combed quartz is found in great abundance in the green-stone slate, particularly along with the copper ore. It appears often on the surface, in such places where the water has washed the earth away. It looks then like indurated marl, which in other parts of the country is very common.

"The rock† is covered with a red coarse gravel, which is the superficial soil of this part of the country. In my opinion, this is formed from the decomposition of the green-stone slate, and its quartzose and ferruginous contents ; for copper

* One of my specimens from Nellore is abundantly curious and interesting. It consists of distinct layers of the carbonate, alternating with black micaceous schist, or rather green-stone, affording exactly the appearance of gradual deposition from a liquid at this earliest period of geological formations. The angle formed by the strata of this striated rock with the horizon is stated by Mr. KERR to be about 45°.—J. P.

† See Dr. BENZA's observations on veins of quartz pervading decomposed pegmatite, J. A. S. iv. 421.—ED.

ore is often found in it in considerable quantity, and in the same situation, as in the slate rock.

"At Yerrapillay, in a new mine, which I opened, I found two layers of ore in it, at distances of four feet asunder.

"The thickness of this stratum of gravel differs according to its situation, whether it is on a high or low ground. I have found it from 4 to 6 feet, and more.

"The copper ore which Dr. THOMSON calls Anhydrous, the most common kind, is in flat pieces, externally, of a brown ochry color; internally, of a black iron color, which often passes into green; when moistened with water, it becomes almost immediately throughout green; in some places, it is bluish grey throughout. Lustre, in some places, where it is black, semi-metallic; and in the bluish grey, metallic*. The copper indeed is in an almost metallic state in it. Fracture approaching to even fine grained streak: of the black, brighter metallic; powder, "*greenish*," not very hard, except the iron black and bluish grey part: which is with difficulty scratched by quartz; brittle; not particularly heavy. Specific gravity, 3.09. Some pieces are found of a nut brown color, and some with conchoidal fracture. The foreign admixtures are various, as white and green quartz, mica, iron ore; mountain blue and malachite are in some places found with it. In other places, I suspect the admixture of silver. For the analysis, I must refer to that of Dr. THOMSON, in a paper laid before the Royal Society of London, which I was permitted to publish as an appendix to my "*Tracts on India*." I will only mention here, that on an average, he procured 50 per cent. of pure copper. In the dry way, or by simply smelting the ore, we have received the metal in *greater proportion*, which may be easily accounted for by the quantity of iron, which the ore contains, that cannot be separated, as when the analysis is carried on by acids and other re-agents."

Mr. HAYNE seems to have been wrong in imagining, that the natives had only discovered these mines 50 or 60 years before (about 1750). Mr. KERR, who has since visited the whole of the mining district, and examined all the formations, and the old works, with great care, states, that the former excavations are of prodigious magnitude, many of them occupying several hundred feet square, and having a depth of 50 or 60 feet. The matrix rock and rubbish are now accumulated in these immense tanks; but on clearing them away, the mouths of the galleries extending into the rocks were discovered; blocks of the ore, (perhaps some that had been gathered previous to the discontinuance of working the mines from some political convulsion or oppression,) have been used to mend the village tank at *Guramanyenta*, and Mr. KERR imagines, that any quantity of the

* This description accords so completely with that of No. 3, in the subjoined analysis, that I have no doubt Dr. HAYNE has mistaken the sulphuret for Dr. THOMSON'S ore.—J. P.

richest ore* may be obtained at a trifling expence, and within 100 feet of the surface. Extensive hills, formed of lumps of ferruginous slag, now covered with vegetation, point out the situation of the ancient smelting houses. A piece of this slag (which was at first mistaken for a volcanic product) was analysed by myself. It yielded but faint traces of copper, shewing that the native processes of extraction, however rude, were effectual in completely separating the metal. But I must now proceed to observe upon the actual specimens of the ore submitted to my examination, purposely avoiding all allusion to the mercantile value of the mines, the estimates of the expence of working them, and the invitations to join in an association for this purpose:—objects which are highly interesting to the community, connected with so laudable a measure for developing the natural riches of the country; but which cannot with propriety be entered upon in a work devoted exclusively to literature and science.

The ores now presented to me are from three different localities. They differ considerably in quality one from the other, and all from the former ore, which Dr. THOMSON pronounced to be an anhydrous carbonate, new to mineralogy.

No. 1. A parcel, weighing 90 lbs. of roughly-picked and cleaned ore, has a quartzose matrix, in some parts colored green, or appearing so from the malachite beneath the transparent crystal. It contains much iron, which, on solution in an acid, appears in the form of a yellow ochre. Ten per cent. of quartz was separated from this specimen on pounding it roughly before setting it apart for analysis.

No. 2. A parcel of the same weight is labelled "*Bungeral Mettah*," and is the species stated to be found in clustered nodules in the alluvium, of rounded exterior, as though they had been detached from their original site, and reburied here. The ferruginous matrix of this ore, on solution, assumes the appearance of a dark-red oxide. It is the same probably as that of Dr. THOMSON's specimen. The carbonate of copper runs through it in veins, but the mixture of sulphuret of iron and perhaps of copper with the oxide, gives the whole a dark arenaceous texture.

No. 3. The richest ore of the three is at the same time the most abundant, and promises to yield the safest return, as it runs in unbroken veins. This ore is a combination of carbonate and sulphuret, the former intermixed with the latter, but readily distinguishable from it, as the sulphuret is crystallized, and has the grey metallic lustre

* The "steel-grained, crystallized silvery ore, invariably found in green-stone slate, and partly imbedded in quartz, the richest ore met with," is doubtless No. 3, the sulphuret.—J. P.

of galena. The specific gravity of this ore is 3.77, being intermediate between that of the carbonate, 3.2, and the sulphuret, 4.5.

The analysis was conducted for the sake of expedition on separate parcels of 100 grains each, in lieu of attempting the separation of the ingredients from a single parcel. Some variation may thus be induced from the irregularity of the ore; but, on the whole, the results ought to be more trust-worthy. Thus: the carbonic acid was estimated by the loss of weight on digesting 100 grains, finely pounded, in dilute nitric acid. The water, (for none of these ores was found to be anhydrous,) by heating in a glass tube, removing the aqueous vapour by bibulous paper, and ascertaining the loss. As the ore generally lost its green colour by this operation, it is possible that a portion of carbonic acid was also driven off. Calcination in an open dish, in the muffle of an assay furnace, gave a loss, which was compounded of that of the carbonic acid and the water. Calcination drives off the sulphur also, but the equivalent of oxygen, which replaces it, being of precisely equal weight, this operation affords no test of the quantity of sulphur present.—In fact, not expecting from Dr. Thomson's analysis, to find sulphur in the Nellore copper ore, I at first neglected the precautions necessary for its separation. This was accordingly effected on other samples, by boiling in strong nitric acid, which, from its heat, caused part of the sulphur in a pure state to rise in fused globules to the surface: while a portion, being oxygenated, was afterwards separated by precipitation with barytes.

The quantity of copper was most conveniently estimated from the black oxide taken up from the calx by dilute nitric acid. It was also obtained directly from other samples by reduction of the oxide with charcoal and borax.—The iron and pyrites were deduced from the difference between the residue in the cold solution, and that from the hot dissolution in strong acid of another parcel, before calcination.

Collecting together the results of the above operations, we have the following data, whence to deduce the composition of the three specimens.

	No. 1.	No. 2.	No. 3.
a. Loss of carbonic acid by digestion in dilute nitric acid,	12.0	14.6	7.0
b. Loss of water (and some carb. acid?) by heating without air in a glass tube,	5.0	7.0	3.0
c. Total loss on calcination with access of air,	17.5	17.8	21.0
c2. Ditto average of two other trials (more carbonate,)	20.0	20.3	23.5
d. Oxide of copper taken up from calx c by dilute acid,	37.7	49.2	73.7
e. Residue of insoluble earths and ox. iron, after d,	44.8	33.0	5.3*

* This residue may have consisted partly of sulphuret of copper that had escaped decomposition in the fire; for another specimen was wholly soluble, and little iron was present in the solution.

	No. 1.	No. 2.	No. 3.
<i>f.</i> Residue from digestion of crude ore in boiling nitric acid,	20.0	13.9	19.0
<i>g.</i> The same, after burning off the sulphur and redigesting in do.	20.0?	8.5	0.0
<i>h.</i> Sulphur, separated on boiling in strong acid.	0.6	2.1	9.0
<i>i.</i> Sulphate of barytes precipitated afterwards,	1.4	17.8	28.5
<i>k.</i> Weight of metallic copper actually recovered from <i>c</i> 2,	28.5	52.2	59.0

In regard to *d*, No. 3, it was observed on digestion in cold nitric acid, that a very considerable portion of the calx of copper was of a red color, or in the state of protoxide, or perhaps in a metallic state, and was not taken up without disengagement of nitrous gas;—the weight 73.7 must therefore be increased, to give the true weight in terms of the peroxide. This is also proved by the amount of loss in *c*, 21.0, which is considerably in excess; and it was remarked on removing the calx from the fire that it was agglutinated, so as perhaps to have prevented the access of air to oxidate the interior.—The sulphur enables us to approximate the correction of this item; for 12.8 requires 51.5 copper, = 64.3 black or peroxide; and this, added to 22.8, the peroxide of the carbonate, would give 87.7; which is 14.0 greater than the actual return from the fire.—Again, deducting the deficiency after calcination (*c.*) 21.0, from the sum of the three volatile ingredients—sulphur, 12.8; carbonic acid, 7.0; and water 3.0 = 22.8, there remains but 1.8 for the weight of oxygen absorbed in place of the sulphur; whereas 12.8 are required.—Adding the difference 11.0 to *d*, we shall have 84.7. This number will be found to be a little in defect from the subsequent results; while 87.7 is a little too great; a mean may therefore be adopted.

From the above data, we may now proceed to extract the simple elements of each specimen of ore;

	No. 1.	No. 2.	No. 3.
<i>l.</i> Metallic copper, calculated from the oxide <i>d</i> ,	30.2	39.5	69.0
<i>m.</i> Pure sulphur, from <i>h</i> and <i>i</i> ,	0.8	4.5	12.8
<i>n.</i> Carbonic acid, less $\frac{1}{10}$ th for hygrometric moisture, ..	10.8	13.1	6.3

The carbonic acid being supposed to be wholly combined with copper, while the sulphur may be partly united with iron, we may calculate the proportions of the carbonates and sulphurets by means of the scale of chemical equivalents, thus:

	No. 1.	No. 2.	No. 3.
<i>o.</i> The carbonic acid will require copper,	31.4	38.6	18.3

Now in the first two of these, the copper required so nearly agrees with the calculated weight of metal, *l.* that the latter may be looked upon as existing here wholly in the form of carbonate, and the sulphur

as united entirely with iron*. In No. 3, however, we find that the majority of the copper remains; and knowing the nearly total absence of iron in this specimen, we may conclude it to be a mixture of nearly two parts sulphuret, with one of carbonate.

The miner would rest content with the determination of the pure metal in the ore, and would have good reason to be satisfied with the 60 per cent. "actual yield" of No. 3, or even with the 30 per cent. of the poorest of the three ores; but the mineralogist will prefer an exhibition of the component salts of the ores, according to the usual synthetical formula. I may here remark, that the water separated (*b*) is more than is required to convert the carbonate into a hydrate or ordinary malachite: thus,

	No. 1.	No. 2.	No. 3.
<i>p.</i> The copper combined with carbonic acid being, . . .	30.2	39.5	18.3
<i>q.</i> will require water to hydrate it,	4.2	5.5	2.6

The excess in *b* may have been carbonic acid, partially driven off.

The chemical composition of the three minerals may therefore be thus expressed:

	No. 1.	No. 2.	No. 3.
Hydrated carbonate of copper,	52.4	68.5	31.7
Sulphuret of copper,	0.	0 ?	63.0
Sulphuret of iron,	2.1	12.4	0.0
Oxide of iron, silex, &c.	43.5	25.4	5.3
Loss or excess,	2.0	—6.0	0.0
	100.0	100.0	100.0

The excess in No. 2, is doubtless owing to the irregularity of the rocky admixture in different specimens, whereof one yielded 44, and another only 13.9 of insoluble matter, on digestion in acid.

The richness of the last of the three minerals will more than compensate for the increase of trouble and expence in the reduction of the ore by successive roastings; and practical miners assert, that the glance or grey sulphuret is a much steadier and more plentiful ore than the carbonate.

I should add, before concluding the above imperfect analysis of the Nellore copper ores, that I tested them in vain for silver and other metals. Neither did arsenic appear to be present.

J. PRINSEP.

* In the second Analysis of No. 2. however, the copper actually recovered, *k*, so much exceeds this quantity, that it is evident this ore frequently contains sulphuret, or is of very variable quality.

ADDITIONAL DOCUMENTS.



MEMO.

THE copper mines in the Nellore and Cuddapah districts were discovered about 40 years ago by Mr. Benjamin Hayne, who reported on them to Government in the fullest and most satisfactory manner—and this gentleman, in his “*Hayne’s Tracts on India*,” gives a most favorable account of them.

From Mr. Hayne’s notice of the subject, a Captain R. Ashton, of H. M. 12th Foot, interested himself about these mines, and collected a large quantity of the ore from within 35 feet of the surface, which he sent to England: the result on the smelting of one batch, sent home by Captain Ashton, (by the “Welch Copper Company,” who could not have been expected to view the subject very favorably,) is submitted. The Welch Company made the out-turn of metal only 23 per cent.—this, although about two hundred per cent. better than the Cornwall ores, is *not* above *half the average* yield of the Nellore ores.

THE ANALYSIS OF ORE, BY T. THOMPSON, M. D., * F. R. S. E.

A paper, read before the Royal Society, November 18th, 1833, by Thomas Thompson, M. D., F. R. S. E., viz. Analysis of a “*New Species of Copper Ore*.”

From Hayne’s description, it is probable, that it occurs in nests, in primitive rocks, which seem to be green-stone, or at least connected with primitive trap. These rocks appear to be subordinate to mica-slate. Copper mines had been wrought in these mountains some centuries ago; but they had been

abandoned, probably on account of the various revolutions to which this part of India has been subjected.

The most common ore which occurs in these mountains is malachite, and it seems to occupy very extensive veins; but the species which I propose to describe here occurs also in considerable quantity. It had been already made the subject of various experiments, with a view to determine how much copper it contained; but I am not aware that any person had subjected it to a regular chemical analysis, or recognised it as a new species.

All the specimens of this ore which I have seen are amorphous; so that, as far as is known at present, it never occurs crystallized. Quartz crystals, indeed, are imbedded in it abundantly, and very irregularly—sometimes they are single, sometimes they constitute the lining of small cavities to be found in it. These crystals are translucent. In some rare cases, they are colourless; but by far the greater number of them are tinged of a yellowish red, and some of them are green. The mineral is likewise interspersed with small specks of malachite, and with dark brownish red, soft particles, which I found to consist of red oxide of iron.

The colour varies in consequence of the irregular distribution of these extraneous substances. One specimen, which was the most free from the malachite and the red particles, was of a dark blackish brown colour. But in general, the colour is a mixture of green, red, and brown, sometimes one, and sometimes another, prevailing. Small green veins of malachite likewise traverse it in different directions.

The fracture is small, conchoidal, and in some parts of the mineral, there is a tendency to a foliated fracture. The lustre is glimmering, owing, I conceive, to the minute quartz crystals scattered through it. The kind of lustre is resinous; and on that account, and the variety of colours, this ore has a good deal of the aspect of serpentine.

It is soft, being easily scratched by the knife. It is sectile. The streak, reddish brown. The specific gravity, 2.620.

It effervesces in acids, and dissolves, letting fall a red powder. The solution is green or blue, according to the acid, indicating that it consists chiefly of copper.

After a few preliminary trials to ascertain the nature of the constituents of this ore, I adopted the following mode of analysis:

1. 100 grains, in the state of a coarse powder, were put into a phial containing diluted sulphuric acid, and the mouth of the phial was stopped with cotton wool. The loss of weight, when the effervescence was at an end, amounted to 16·7 grains. This loss was owing to the escape of carbonic acid gas.

2. 100 grains of the ore were treated in the same way with muriatic acid. The green solution was decanted off, and evaporated nearly to dryness. To get rid of the excess of acid, a plate of zinc was then put into the liquid, previously diluted with water. The copper precipitate weighed 48·5 grains.

On repeating the analysis, I found that the muriatic acid had likewise taken up a portion of iron. I therefore supersaturated the solution with ammonia, and threw the whole upon a filter. By these means, the red oxide of iron was separated. The ammoniacal solution was then neutralized by muriatic acid, and the copper thrown down by a plate of zinc. But during my first analysis, none of the iron was taken up by the cold muriatic acid, owing, no doubt, to the state of its aggregation.

3. The red powder, which remained undissolved after the muriatic solution was drawn off, was boiled for several hours in nitromuriatic acid. The matter gradually diminished in bulk, and became white; while the acid acquired a golden yellow colour. The acid was now separated from the undissolved powder, evaporated nearly to dryness, to get rid of the excess of acid, diluted with water, and mixed with an excess of ammonia. A brown powder fell, which was separated by the filter, and which, after being dissolved in muriatic acid, was precipitated dark-blue by prussiate of potash. The remainder being mixed with tallow, and suddenly heated in a covered crucible, became black, and was attracted by the magnet. These properties leave no doubt that the powder was peroxide of iron.

4. The ammoniacal solution had a light-blue colour, I therefore neutralized it by muriatic acid, and put it into a polished

plate of zinc. I obtained a sensible deposit of copper ; but so small, that I was unable to collect and weigh it. I estimate it at about 0·1 grain.

5. The white undissolved matter, being heated to redness, weighed 2·1 grains. On examining this matter attentively, I found it entirely composed of fragments of quartz crystals, which had been interspersed through the ore, and had, from their minuteness, escaped my observation.

6. From the facility with which the copper dissolved in muriatic and sulphuric acids, there could be no doubt that it existed in the ore in the state of an oxide. But the red colour of the ore made me uncertain, whether the oxide was the red, or the black. I therefore put 100 grains of the ore into a tall narrow phial, filled the phial full of water, and then by means of a funnel, poured a quantity of muriatic acid into the bottom of the vessel. The ore was immediately attacked, and the solution from the very commencement appeared green. This I consider as a demonstration that the copper in the ore was in the state of black oxide. Now black oxide of copper is a compound of 100 metal + 25 oxygen. So that the 48·6 grains of copper, extracted from the ore when in the state of black oxide, must have weighed 60·75 grains.

From the preceding analysis, it appears that the ore is composed as follows :

Carbonic acid,.....	16·70
Peroxide of copper,.....	60·75
Peroxide of iron,.....	19·50
Silica,	2·10
Loss,	0·95

100·00

The silica was obviously accidental, and derived from the quartz crystals ; so that the ore, in fact, consists of carbonic acid, peroxide of copper, and red oxide of iron. In the different analyses, I have found the copper to vary a little. The least quantity I obtained was 48·6, the greatest 51 grains.—These variations are owing chiefly to the admixture of quartz

crystals, and partly to the specks of malachite and red oxide of iron with which the ore is interspersed.

The carbonic acid is obviously combined with the black oxide of copper, so as to constitute "carbonate of copper." Now, carbonate of copper, as I ascertained by a direct analysis, is composed of an integrant particle of carbonic acid, and an integrant particle of black oxide of copper. An integrant particle of carbonic acid, as I have shewn elsewhere, weighs 2·751, and an integrant particle of peroxide of copper, weighs 10.

Now 2·751 is to 10 as 16·7 is to 60·75, so that there can be no doubt that the carbonic acid and oxide of copper are united in the ore. As to the oxide of iron, I am disposed to consider it as only mechanically mixed; because, in one experiment, I dissolved almost all the copper without touching the iron. Yet it deserves attention, that 77·4 and 19·5, the weight of carbonate of copper and oxide of iron, found by the preceding analysis, correspond with three integrant particles of carbonate of copper, and one integrant particle of peroxide of iron.

We were previously acquainted with two other native species of the salt, namely, malachite, and blue carbonate, or copper azure. But both of these are "*hydrous*" carbonates, containing water as a constituent; and if any confidence is put in the analysis of *Klaproth*, whose precision is sufficiently known, malachite contains twice as much water as the blue carbonate. Blue carbonate is a compound of one integrant particle of water, and one integrant particle of carbonate of copper; white malachite contains two particles of water. Our ore is an "*Anhydrous carbonate of copper*." When heated to redness, it loses its carbonic acid, but undergoes no further change. Some specimens lost about half a grain more than their carbonic acid. This I ascribed to the water in the malachite, with which the ore was occasionally mixed.

REPORT ON THE NELLORE COPPER MINES, BY BENJAMIN HAYNE, M. D., COMPANY'S NATURALIST, FORT ST. GEORGE.

The districts on the coast in which copper ores have been discovered are those of the Calastry and Vencatagherry Zemindaries, and the Udygherry Jaghir, in the zillah of Nellore, and Duppaud and other places in the ceded districts.

I intended on my late excursion to give a full account of them all, but was prevented by the heavy rains, and obliged to confine myself chiefly to those in the Calastry Zemindary, which, by Captain Ashton's attempts of working them, have excited the most interest, and have become even lately the subject of speculation and of discussion at the presidency.

As the Udygherry district lies very near to the latter, I have taken an opportunity of seeing them also, and will mention them occasionally when any circumstance should occur of comparing and contrasting them with those under particular consideration.

The district of Calastry, in which the mines are situated, is the most northern of that Zemindary; to the west of it lies the Udygherry Jaghir, and the ceded districts; to the north, the Naidoo country, a district belonging to the Vencatagherry Rajah, and to the eastward, the Nellore district. The villages, indeed, of the different countries lie here in a strange manner intermixed, owing to former feuds and irregular settlements between the petty chiefs of the country.

The principal mining places are at the distance of about 50 miles N. W. from Nellore and 30 miles from the sea, about the latitude of Ramapatam, a place well known to all travellers up and down the coast, and about 40 miles N. E. from Cuddapah.

Several rivers run right through it on their way to the sea from the western hills, of which the Pillapeyroo, Vuppovagoo, and Manyroo form a junction not far from Gurramenapentah, the principal mining place, and from a pretty large river, which is said to have a good deal of water throughout the year. Its

beds are very stony, which seems in the eyes of the natives the greatest objection against its being made navigable for boats; it deserves therefore an accurate survey.

The general aspect of the country is barren, and uncomfortable in the extreme; large trees are only found in and near the villages; and on the wide, extended plains on both sides of the river, nothing encounters the eye, but here and there a small thorny shrub. The grass, which in the rainy seasons every where else carpets the country with a refreshing green, is here both scanty and of the poorest kind—a species of “*aristida*,” which, as the name implies, is a compound of long beards or bristles; this is the case in most mining countries. The surface of the soil contains in many places so much salt, that the inhabitants could make enough, if allowed to do so, for their own consumption.

In summer, this part of the country is extremely hot. The villages are small, and the houses mean: they consist generally of three or four small detached huts, one serving as a sleeping room for the family, the other, for a working room, and the third for stores. The cattle are kept in the open air, except in the rains, when they form part of the family in the houses. The inhabitants appear healthy, and numerous.

The cultivation is chiefly confined to paddy, for which there are large tanks near the villages. On the high grounds, they sow some dry grains, and in the proper season, horse gram: the former looks even in this fine season miserably poor.

To the eastward, the country is open, only here and there a few low hills are to be seen; but to the westward, there are ranges of hills, the nearest at the distance of about 10 miles. Due west is one called Malla-condah, from being the highest hill in the range. It is said to abound with wood. The Udygherry mountains are to the south-west about 16 miles, and the highest in this part of the country: the highest point I take to be about 3,000 feet above the level of the low country. I have seen myself, that plenty of large wood grows there, particularly between the valleys.

About 20 miles on the way to the sea, in *the direction of Ramapatam, are extensive jungles.*

1. Korra, *Panicum italicum*, L.
2. Aruga, *Paspalum tomentacium*, L.
3. Woolava, *Glycene tomentosa*, L.

This country is, geologically speaking, of a primitive description, the general rock formation is a mica-slate, of different colors and consistence. It shews itself first in the low country, at the distance of about 15 miles east from the hills; it forms sloping mountains, which are often capped with hornstone slate, which passes into sand-stone, and on the other hand, into jasper. The tabular summits and mural precipices of the Udygherry hills consist of the latter stone kind: the layers or strata of the mica-slate occur in different positions and inclination to the horizon, often in the low country, forming a right angle with it; on and about the Udygherry hills, the strata appears in the utmost confusion, as if thrust by force out of their proper position. Traces of copper ores are often found in this rocks, and it is generally known to contain various metallic veins, "*as gold, silver and copper.*"

Subordinate to the former is green-stone slate, in mighty layers, often as to appearance constituting the principal rock of a district for many miles. This is the case about Guramanypta and the other mining places. The layers or stratification of the latter rock I have as yet always found in a horizontal position.

The green-stone slate is often approaching to greenstone; it occurs then only obscurely slaty, has a jet-black color, strong glossy lustre, foliated fracture, hard in a small degree: in this state it seems here barren of metals of any kind. The real green-stone slate is of a bluish black color, with small white spots of decomposed felspar, half hard, and when exposed to the air, it crumbles soon to pieces, and takes a green color. The rock is reckoned one of the "*richest mother of ores*" of any in the world. In it are found "*silver*" and "*copper*," in rich beds or layers, as is the case here, but never in veins, as in other formations.

The layers of copper are of different thickness and distances from each other: the general run of the pieces of ore, constituting the layers, is two inches in thickness; but they

have been found also of several feet. The pieces are in general flat, as if compressed, and coated with ochre. The vertical distance between the layers is 4 to 8 feet, and the horizontal, is even more uncertain.

A corroded honey-combed quartz is found in great abundance in the green-stone slate, particularly along with copper ore. It appears often on the surface, in such places where the water has washed the earth away. It looks then like indurated marl, which in other parts of the country is very common.

This rock is covered with a red coarse gravel, which is the superficial soil of this part of the country. In my opinion, this is formed from the decomposition of the green-stone slate, and its quartz ore and ferruginous contents; for copper ore is often formed in it in considerable quantity, and in the same situation as in the slate rock.

At Yerrapillay, in a new mine, which I opened, I found two layers of ore in it, at distances of four feet asunder.

The thickness of this stratum of gravel differs according to its situation, whether it is on a high, or low ground: I have found it from four to six feet, and more.

Copper ore, which Dr. Thomson calls "*Anhydrous*," the most common kind, is in flat pieces: externally, of a brown ochry color; internally, of a black iron color; which often passes into green: when moistened with water, it becomes almost immediately throughout green; in some pieces it is bluish grey throughout. Lustre, in some places, where it is black, semi-metallic, and in the bluish, grey metallic; the copper indeed is in an almost metallic state in it; fracture approaching to even, fine-grained; streak of the black, brighter; metallic powder, "*greenish*;" not very hard, except the iron black, and bluish grey part, which is with difficulty scratched by quartz; brittle; not particularly heavy; specific gravity 309: some pieces are found of a nut brown color, and some with conchoidal fracture. The foreign admixtures are various, as white, and green quartz, mica, iron ore, mountain blue, and mallachite, are in some places found with it. In other places, I suspect the admixture of silver. For the ana-

lysis, I must refer to that of Dr. Thomson, in a paper laid before the Royal Society of London, which I was permitted to publish as an appendix to my "*Tracts on India.*" I will only mention here, that on an average, he received 50 per cent. of "*pure copper.*" In the dry way, or by simply smelting the ore, we have received the metal in *greater proportion*, which may be easily accounted for by the quantity of iron which the ore contains, that cannot be separated, as when the analysis is carried on by acids and other re-agents.

A quantity, which had been sent home some years ago by Captain Ashton to England, was assayed by order of the Court of Directors, in the common way, by the people trading in copper: and according to the report which I have seen, the result was different from any made in this country; and from that of Dr. Thomson's, the best parcel, I believe, there were 6 or 8 made, of different qualities, yielded only 17, and the lowest 6, per cent. By my inquiries on the spot from whence it was sent, and from people who then were employed in the business, I understand, that Captain Ashton himself was not present when the ore was dispatched, and that a servant of his "*sent all the rubbish he could collect about the mines.*" This, however, will not quite account for the low valuation of the best kind, of which, (it may be presumed,) there must have been a quantity among the whole.

The discovery of these mines, by the natives, seems to be an event of latter times; and to judge from the appearance of the old mines, and the account of the natives themselves, the period cannot be reckoned further back than 50 or 60 years: they are ignorant at present of the person who first made the clumsy attempt. In the Calastry country, I have found but one place at Yerrapillay, which was pointed out to me about 12 years ago, when it appeared, as if it had been worked but a few years before; the first undertakers seem to have confined themselves chiefly to the mines which they discovered on the hills, as appears at Wangapaudoo, in the Vencatagherry, and Sacalacondah, in the Nellore, district: as to my discovery of them in 1801, I beg leave to refer to my reports on the subject to Government.

A year after, Mr. Travers, who had become attentive to the subject, by my researches in his, and the neighbouring, districts, reported the discovery of copper mines in the Calastry country to the Board of Revenue, which is the reason of their ascribing the first notice of them as having originated with that gentleman, in their letter to Government, dated 20th July, 1815.

Captain Ashton, introduced by Mr. Travers, made his offer of working them to the Calastry zemindar, and to Government, and obtained a lease for five years.

The principal mines, which have been opened by Captain Ashton, lie within a small distance from each other on the banks of the rivers Pettapeyroo and Vuppoovagoo: the most promising are close to a village called Guramany-penta, where, at the depth of from 4 to 15 feet, a great quantity of the richest ore has been found. The ground is rather low, and a large tank close by it, on which account the water rushed in and impeded the work. This ground, however, I take to be 60 feet at least above the level of the river, which is at the distance of about half a mile west from it: the high ground east of it is equally rich; and about a quarter of a mile south, he had another mine, on ground belonging to a village called Sallaguryguloo.

At Bungaralapadoo, or rather on grounds belonging to a village of that name, situated between the rivers of Pettapeyroo and Vuppoovagoo, Captain Ashton has made various attempts. At one place, he went to the depth of about 50 feet, and found great store of fine ore. This mine is about 100 yards from the bed of the river, and the bottom of the mine I take to be on a level with it; he discontinued the work on account of an accident that happened to some people working in it. At many other places, in the vicinity of this, trifling attempts have been made, and so far successfully, as to get a good deal of ore with the least possible expense.

As my views were to ascertain the nature of the rock, and its contents, and the way in which the ores were found in it, I opened a mine, on a high ground of the village of Yerrapillay, which lies about five miles north from Guramany-

penta ; and on a continuation of the same plain, some loose pieces of ore, that had been found in a nullah, determined me as to the spot. The heavy rains, which soon after set in, prevented me from going deeper than 16 feet ; but with the assistance of about 10 people a day, for three days, I discovered three different layers of ore, and got about one candy (500 lbs.) of very good ore, great part of which I brought with me to Madras. The observations I made are contained in the antecedent part of this Essay.

From what I have said, it will appear, that I think the mines in the Calastry country well worth the serious consideration of Government ; but in order to bring the reasons which are dispersed in different parts of this Essay under one view, I will recapitulate them in as narrow a compass as possible.

The mines in Calastry recommend themselves for consideration.

1st. On account of the advantageous situation, 30 miles from the sea, and within 20 miles of abundance of fuel.

2nd. On account of a river, which might be made navigable, and the banks of which are from 70 to 80 feet under the level of the adjacent country.

3rd. On account of the general and particular rock formation in which the ores are found, known to be generally rich in ores, viz. mica-slate and green-stone slate ; and lastly, on account of the richness of ore itself.

(Signed) BENJAMIN HAYNE,

Company's Botanist and Naturalist.

A true copy,

(Signed) T. R. WHEATLEY,

Secretary to Govt.

True Extracts,

C. A. KERR.

Madras, 15th December, 1815.

EXTRACTS FROM THE SECOND REPORT ON THE COPPER MINES OF NELLORE, BY BENJAMIN HAYNE, M. D., COMPANY'S NATURALIST, FORT ST. GEORGE.

AFTER the general account which I have given of the Calastry mines in my former report, it is incumbent on me now to submit also, what I conceived would be the best means to render them useful to the "Honorable Company," in order to acquit myself fully on so important a subject, as my limited knowledge and limited means will enable me.

For the success of speculations of this kind, the greatest economy is required, particularly in things which are not absolutely necessary. Buildings and costly machinery should be dispensed with, and none ever erected, until the latter is absolutely wanted, and the former allowable by the most favorable events in the undertaking. On this principle was the Saltpetre Manufacture on the coast by me introduced, and thus should every other which I would undertake—the privations excepted, which I then voluntarily underwent, but which now my advanced years could not possibly support.

In the present instance, little more is required in the beginning than to set people at work, and direct them how to bring the ore in the most convenient manner to light. The nature of the rocks, and the beds of ore, require but little skill to do this; yet is a portion required, which, as we have been taught by experience on this very subject, not every body possesses, nor can any general direction be given about it. The internal management must be left entirely to the person to whom the superintendence is confided.

In general, I will observe, that on account of the ore being in beds or layers (as coals), a large surface of ground must be laid open, which requires a greater proportion of manual labour than if the metal was found in veins. On the other hand, it is for the same reason, easier to be worked, and without any machinery. The water may be drained to the depth of 50 feet into the river, which lies either close to the mines, or at no very great distance from them. If the beds should continue to a greater depth than 50 feet, the water of the wells

may be discharged by Pacotas into the common drain. As there is no veins, it is unnecessary to provide for horizontal tunnels, and the superficiality of the ores renders perpendicular shafts useless ; but in order to lessen labour, earth-bores will be required.

Although the rock is by no means hard, it will save a great deal of hard labour to provide for means of blasting it. A few Pioneers, who are trained up to this work, could be usefully employed.

Labour is in most countries the principal object of expense. In England, labour is supplied often by machinery, which, however, at first is very expensive. In this country, we are fortunately relieved from any strict investigation of this kind by the cheapness of labour in general ; and Government have it in their power to find a great number of labourers, with the least additional expence to their present establishment. I mean the convicts in the zillah prisons, who have hitherto been mostly employed in an unprofitable work. Five hundred, or a thousand of them, would in a few months establish the value of the mines. I need not expatiate on the fitness of this kind of work for convicts, as it is one which in general is assigned to them in all countries : should there, however, be an objection, of which I am not aware, a sufficient number of people may be found accustomed to that kind of work ;—the tank-diggers of the country, who work about 10 hours in the day, for $1\frac{1}{2}$ fanam a man, and one fanam a woman. (equal to 3*d.* and 2*d.*, English-money) and think themselves liberally paid : they work in general by contract, according to measurement ; and for reasons which I need point out, it is for both parties the fairest way. But Captain Ashton, little acquainted with the customs of the country, settled the payment by the day ; and it will be found difficult in the beginning to persuade them to revert to the old way by contract.

Among the great number of European soldiers in His Majesty's and the Honorable Company's army in India, I do not doubt many miners will be found, one or two of whom would be of great use in directing the manual labour of the mines and smelting furnaces.

The ore is of that nature, as not to require any other previous operation for smelting, but that of reducing the larger pieces to a smaller size, as it has neither sulphur or arsenic, or any admixture which requires separation; nor does it want any other addition but a moderate quantity of charcoal for bringing it to a state of the greatest purity. It exists nearly in a metallic state in the ore. I have seen at Guramanypenta, on the place where Captain Ashton's bungalow stood, a quantity of ore which he had wasted, I do not know for what purpose, and found among it a great number of pieces which had run into pure metal.

The erection of furnaces will be neither expensive nor difficult, but as they belong to the internal management, it must be left to the person who undertakes the superintendence, who, in this, as well as in the working of the mines, must be guided by local and other circumstances.

I have stated in my former report, that fuel may be had at a distance of from 12 to 20 miles; the former to the westward, and the latter to the eastward, of the place, and within a short distance (10 miles) from the sea. It will become a matter of consideration, whether the ore is to be carried to the place where the wood is found, or the charcoal to the mines; or whether it would not be better to send the ores "*in as pure a state as they can be made as ballast to England.*" In the latter state, I believe there is no law to forbid their importation. I know that ores of copper are often sent from America to be smelted in Wales, where, by the bye, they are thought smelt-worthy when they contain but "*4 per cent.*" of good metal. But should the ore be required smelting in this country, it can be no great object of consideration if it only contains 25 per cent. whatever it is done. I think, that it would be advisable to send the ore to the Ramapatam jungle, from whence the copper may be easily sent to any other part of the country by sea. At all events, the ore should be carried to where the fuel is, as six or eight times the quantity of wood will be required to one of the ores. But this and many other subjects will be better argued before a Board of Mines, and after the acquisition of more local knowledge.

I have mentioned in my former report the Duppaud country as one in which copper is found: I would recommend this to particular attention, should it be found advisable to enter into an undertaking of the kind. From the specimens I have seen, brought by Captain Arthur of the Engineers to the presidency, the ore is of the best kind, and according to his report, in abundance. The place is north of Cummum, in the ceded districts, and lies in many respects more favorable than the Calastray, as the neighbouring hills have abundance of wood, and as it is in the way of the Lombardies to the coast, who would barter their cotton for the copper, which in the "Nizam's" country is an article of great value.

The salts of particular utility, which are every where found in abundance, are soda and saltpetre.—The latter was first noticed to Government by myself, and the manufacture of it introduced on the coast. I recollect with gratitude and pleasure the encouragement I received from the Board of Revenue, and their intercession with Government for the manufacture, which experienced in other quarters much opposition.

I have given also an account of soda to Government about 10 years ago, which has been published in the Transactions of the Society for Promoting Arts and Sciences, and lately in other works. Hitherto, however, no further use has been made of it in this country; except perhaps in bottle-making; but it is certainly as much worth attention as an article of export to Europe as saltpetre.

(Signed) BENJAMIN HAYNE,
Company's Botanist and Naturalist.

True copies,

(Signed) T. R. WHEATLEY,
Secretary to Government.

A true copy,

C. A. KERR.

Madras, January 17, 1815.

REPORT OF CAPTAIN B. BISHOP.

To His Excellency Sir THOMAS MUNRO, K. C. B., President, &c. in Council, Fort St. George.

HONORABLE SIR,

HAVING lately made an excursion into the Northern Circars, with the sole view of examining into the nature, probable extent, and promise of the copper ore in those districts, and according to the best of my judgment, having found them to embrace prospects of extensive value, I have been induced to throw together in the accompanying paper such remarks as so short and imperfect a survey has enabled me to make, and beg leave to submit them to your Excellency's judgment and consideration.

Conceiving these remarks may induce your Excellency's Government to take this matter into its mature deliberation, and to cause an efficient assay to be made of these apparently decisive advantages, I am prompted to submit proposals for speedily ascertaining to what extent these ores may be worth your further attention.

Before, however, I enter into particulars, it will be relevant to make a few brief observations. And first, your Excellency will at once perceive the impossibility of ascertaining at what depth this ore may be found, and until this has been done, no dependable calculation either of expense or advantage can possibly be made. I am inclined to think, it will be found considerably nearer the surface than in Europe; because it is certain, Captain Ashton obtained it either in veins or masses at the depth of about 35 feet. In Europe it is seldom found at a less depth than 60 or 80 fathoms, or from 360 to 480 feet. However, notwithstanding this and other difficulties, I am inclined to believe, the estimate which will follow cannot very widely differ from what the result will prove, if a trial be made from the data therein detailed.

From many observations, which I attentively made in the country, by observing the depth of water in wells and tanks,

and the time the natives took to empty them by the country method of drawing water, there are good grounds to conclude, that the springs in those mines will not prove copious, and that at most six Pacotas will keep one mine clear with certainty—it is probable, however, that half the number may answer; but as it is better, to avoid leading to error, to estimate in excess, I shall consider six as requisite for one level.

The necessity of working day and night is imperious in all mines where water prevails. Captain Ashton emptied his every day, and suffered them to fill at night. He had only, therefore, a few hours to work, and this alone must have rendered all his proceedings abortive.

Six Pacotas on a stage will discharge 21,600 gallons, or above $7\frac{1}{2}$ tohs per hour.

1. Supposing a mine 180 feet deep—six stages of 18 feet each will be required, consequently the number of Pacotas will be 36. They work night and day in four reliefs—and require one head maistry, four common ones, and 288 coolies.

2. To dig, break, or blast in one mine, night and day, in four reliefs, four maistries, 40 men, and 40 women and children will be required.

3. Gangs also of one head woman and six children in four reliefs, will be wanted to break, wash, and pick the ore for smelting—for one mine, four head women and 24 children.

4. A simple machine to draw up the ore will in due time be constructed—the difference of expense between this and coolies will be about 1 to 2.

5. Smelting furnaces and store-houses attached must be erected, two to each mine, that when one requires repair, the other may be resorted to—one furnace to work also night and day. This will require four fire maistries, four founders' ditto, eight founders or smelters, and eight fire men, and to bring the ore and charcoal, 16 children, in four reliefs.

6. Two pair of large and two of smaller scales and weights will be indispensable.

7. It would be advisable to have an European miner and smelter at each mine; they could doubtless be obtained from some of the European regiments, or from the Artillery.

8. The servants for one mine may be three intelligent boys from the Male Asylum, to be employed as Interpreters and Superintendents, and one Book-keeper. To each relief of water, men and miners, one conicopoly, or eight conicopolies for one mine, and one intelligent head native, to purchase charcoal, settle the carriage of copper to the coast or elsewhere, and perform such other similar services as may be required.

9. A guard of one head and 12 inferior peons to be employed in reliefs day and night.

10. A small assaying furnace, with tests, &c. for assaying the various ores, will be indispensable, as only such as are rich in metal should be smelted, and it will here as elsewhere be doubtless of very different quality.

Charcoal must be purchased by the "*para*," or made on the spot, as circumstances may direct, and the support of Government will probably be requisite, when the necessity occurs of leaving recourse to *topes*.

Two chests of miners' tools and a portion of gunpowder cannot be dispensed with: 13, 14, 15 of the estimate will shew the probable produce of ore and copper—the cost of carriage to Ranapatam, and thence to Madras by sea.

Collecting these details, the probable expense per month will be thus exhibited:

Estimate for opening and working one Mine.

	Ps.	F.	C.	Ps.	F.	C.
1st.—Costs of 36 Pagodas, at Pagodas 12 each, is						
Pagodas 432—Interest on which, at 10 per						
cent. per annum, is per month,	3	26	20			
1 Head Maistry, at per month,	3	0	0			
4 Common, at 2½,	10	0	0			
288 Coolies, at 1½ Fanams per day, is per month,	288	0	0			
				304	26	20
2nd.—4 Maistries, at 2½ each per month,	10	0	0			
40 Coolies, at 1½ Fanams per day, is per month,	40	0	0			
40 Women, at 1 Fanam per do. do.	26	30	0			
				76	30	0
3rd.—4 Head Women, at 2 Fanams per day, is						
per month,	5	15	0			
20 Children, at 1 Fanam,	13	15	0			
4th.—This may cost 200 Pagodas—Interest of				18	30	0
which, as above, is per month,				1	8	0
Carried forward,				401	5	0

N. B. A Pagoda is equal to 3½ M. Rupees.

	P ^s .	F.	C.	P ^s .	F.	C.
Brought forward, .. Pags.				401	5	0
5th.—2 Furnaces, Pagodas 400, Pags. 800,						
2 Store Houses, Pags. 200, „ 400,						
Interest on Pagodas 1,200, as before, ..	10	0	0			
4 Fire Maistries, at 2½ per month, ..	10	0	0			
4 Smelting do. is,	10	0	0			
8 Firemen, at Pagoda 1 each,	8	0	0			
8 Smelters,	8	0	0			
16 Women and Children, at 1 Fanam each						
per day, is per month,	10	30	0			
				56	30	0
6th.—2 pairs large Scales and Weights—2 smaller, Pagodas 150—Interest at 10 per cent.						
per annum, is per month,				1	3	0
7th.—1 European Miner, 12 Fanams per day, ..	8	0	0			
1 Smelter,	8	0	0			
				16	0	0
8th.—3 Asylum Boys, at Pagodas 6 each per month,	18	0	0			
1 Book Keeper, „ 8 „	8	0	0			
8 Conicopolies, „ 4 „	32	0	0			
1 Head Native, per month,	10	0	0			
				68	0	0
9th.—1 Head Peon, at per month,	3	0	6			
12 Ordinary do., at Pagodas 2 each,	24	0	0			
				27	0	0
10th.—1 Assaying Furnace, Tests, Weights, Scales, Crucibles, &c. say Pags. 100—						
Interest, as above, per month,				0	37	40
11th.—When the Furnaces have acquired a sufficient heat, I presume 1½ times the bulk of the ore of charcoal will be sufficient to smelt it—I have found that a candy of the ore will be equal to about 4 cubic feet, a para of charcoal will be equivalent to 1½ of the same measure; but it being better to estimate in excess, I take the ore to the coal, as 4 to 6, (both by measure,) that is one candy of ore will take six of charcoal to smelt it.						
When fairly at the ore, and completely at work, I shall, I trust, estimate in minimum by taking the ore obtained and smelted every 24 hours at 12 candy, or 48 cubic feet. To smelt this it will require 540 para of charcoal a month, or Pagodas, ..				45	0	0
12th.—Two chests of Miners' Tools, Pags. 50—						
Interest per month,	0	18	60			
Gunpowder, 1,100 lb. barrel, at 30 Pagodas per candy,	6	0	0			
				6	18	60
13th.—I calculate I believe greatly under the real produce at 360 candy of ore from one mine per month, and that this will yield 40 per cent. of Copper, or candies 144.						
To carry a candy from the mines to Ramapatam it will cost Fanams 25—144 candies will therefore cost,				80	0	0
Carried forward, .. Pags.				702	5	0

	P.	S.	C.	P.	S.	C.
Brought forward,.. Pags.				702	5	0
14th.—To carry 144 candies by sea from Ramapatam to Madras, say £4 0 0—or Pagodas 10 per ton—144 candies are tons 32-2 3 12—which at the above rate is,				321	6	21
15th —1 Goldsmith or Assayer, at 3 Fanams per day,.....	2	0	0			
4 Stone-cutters, at 2½ Fanams per day, is per month,.....	6	30	0			
2 Carpenters, at ditto,.....	3	15	0			
2 Hammermen, at 2 Fanams,	2	30	0			
2 Bellows Boys, at 1 Fanam,	1	15	0			
Contingencies which may have been omitted or unseen,	10	0	0			
1 Havildar, at 3 Pagodas per month,.....	3	0	0			
6 Sepoys, at 2,	12	0	0			
				41	0	60
Costs per month for working one Mine,				1,064	12	1
In estimating the above, I have endeavoured to avoid every fallacy, and I conscientiously believe, that if the ore be found in the plenty appearances so forcibly hold out, the produce of a mine will considerably exceed the above estimate.—Let it be taken, however, as therein stated. This will be fine copper, and worth at the lowest estimate 70 Pagodas per candy; 144 candies then, at 70 Pagodas, will amount to Pagodas,.....				10,080	0	0
The cost of which, as above, is Pags.....				1,064	12	1
Leaving a gain of Pagodas,				9,015	32	49

Or M. Rs. 31,555 0 59 on one mine.

Should these expectations be once realized, mines may be opened in any number, and as the profits may be considered similar, the magnitude of the project becomes extensive beyond the common powers of estimation.

I experience no inclination to any visionary proceedings, but having seen, and read of the immense advantages obtained by mining, and convinced, that what I have seen and read are quite dependable;—considering also the uncommon indications of abundance of ore in this country, not only of copper, but other metals, and which I have personally inspected; I cannot help concluding, that the subject is one demanding the highest consideration, as relates to the interests of the Company's Government in particular, and to those of the British nation in general.

Having shewn the probable advantages of opening mines in the districts where the best indications of ore may be found, I now offer to undertake commencing the works either on behalf of your Excellency's Government, or on private account ; if undertaken for the former, perhaps the best mode would be on principles similar to those of Mr. Heath's contract for saltpetre ; that is, Government in the first instance to make the required advances, and to take the copper at a fixed rate per candy—or to allow me Pagodas 500 per month, and a reasonable percentage on the whole produce, and Government to take the whole of the copper which may be produced, allowing me also a suit of tents from their stores, until a residence can be erected.

If on private account, Government to extend the protection of their police to the mines, by allowing the peons thereat, to be considered a part of that establishment, and under the authority of the district magistrate, but attached to, and under the direct orders of the Director of the mines ; and also to allow the guard of seven Sepoys stated in the estimate to be attached to the works. Government also to direct their public officers in the mining districts to extend the influence of their authority to the works, and also to use their power, should it be required, in enabling the proprietors of the mines to procure a sufficiency of charcoal.

Ten per cent. on the whole produce of the mines to be paid to the Government, and to be collected in such manner, as it may deem most conducive to their interests.

For the first year, Government to allow the copper to pass free of duty, both on land, and when exported ; after which, the usual duty to be collected ; but at no subsequent period to be increased.

The year of free duty to commence from the transportation of the first quantity of copper produced by the mines.

Government to grant the proprietors the exclusive privilege of working mines for copper, or other metal, or precious stones, should any be discovered, first reporting the same to Government, and working them upon such terms as may be

agreed upon by the parties, for the term of 10 years, or to the termination of the Company's present Charter ; and at the expiration of this term, the privilege to be renewable on such condition as the then Government may see expedient.

Government to extend these privileges to the heirs and executors of the proprietors, subject to such conditions as circumstances may involve, agreeably to the stipulations herein before stated.

With reference to a metallurgical and mineralogical survey of the country, whichever proposal the Government may judge suitable to adopt, I will commence it from the spot where the mines may be opened ; as, however, it cannot be expected I should be able to accomplish more than a commencement, it will follow as a matter of course, that if I continue to direct the mines, the survey must be transferred to other hands. From this beginning, however, should my mode of proceeding be approved of, it will be easy to carry it on, to any extent, as your Excellency will at once perceive that all that is required will be to distinguish metals and minerals on the maps of those surveys already completed.

With relation to a districtal copper coinage, your Excellency will be enabled to judge of its expediency long before the proceeding will be in a state sufficiently forward to adopt it, and it naturally follows as a subject for future consideration.

If, however, the mines be opened on private account, I would solicit the indulgence of the privilege of coining copper money, to be granted to the proprietors of the mines, in such latitude only as might be sufficient to pay the people employed in their works.

Your Excellency will perceive, that in Pacotas, furnaces, &c. an outlay becomes unavoidable of Pagodas 2,132 0 0 ; but even adding the total charge of every description, according to the preceding estimates of the amount, for opening and working a mine one month, will be more than Pagodas 3,196 12-1, or pounds sterling 1,279 13, a sum which considered with

reference to the expense of a similar undertaking in England,
may almost be considered as nothing.

I have the honor to be,

Honorable Sir,

Your most obedient humble Servant,

(Signed) B. BISHOP.

FORT ST. GEORGE, }
June 25, 1822. }

A true copy,

(Signed) T. R. WHEATLEY,

Secretary to Government.

A true copy,

C. A. KERR.

MEMORANDA ON THE COPPER MINES IN THE NELLORE
AND CUDDAPAH DISTRICTS, APPENDED TO CAPTAIN
B. BISHOP'S REPORT.

IN Cornwall, there are a set of people generally experienced miners, out of employ, from the failure of mines, who traverse the country in all directions in search of new ones.

When they discover a new mine, the public inns are frequented where the London coaches stop, and report made to travelling adventurers, of whom there are numbers, that they have discovered a new mine, of whatever metal it may be, and that it possesses every appearance of proving a rich one, with such other matter of inducement as his ingenuity and ability can devise; he is seldom long before he finds some one inclined to engage in the speculation.

The adventurer mentions this to his friends in London, who engage in the first instance to advance a sum of money sufficient to open the mine, to obtain some ore, and procure an assay, usually made by the man who discovered the mine, who previously stipulates, that he shall be employed in the direction of it, upon certain allowances, as Captain of the same.

If upon assay the ore be found sufficiently rich, and other matters also promising fair, the men who advanced the money, in the first instance, form a Company, generally in London. This effected, and a capital raised, one of them is commissioned to proceed to the place, with authority to make advances, and institute other arrangements, for opening the mine with promptitude and effect.

When I was in Cornwall, in 1815, a lead mine had been thus discovered near Truro, which ore upon assay was said to yield 300 ounces of silver in a ton of lead, vide Landaff's "Chemical Assay," vol. iii. page 312.—Sir Hugh Middleton is said to have cleared from his lead mines £3,000 per month, which enabled him to undertake the great work of bringing the new river from Ware to London; but this mine is probably richer in silver than his were. The Company had proceeded to the expense of upwards £20,000,

when I was there, in erecting steam engines, to clear the mine of water, and buildings and furnaces, &c., to extract the silver, and recover the lead. The principal in this concern, I understood, was the famous radical, Alderman Wood : he had mortgaged his share, I have been informed, to enable him to carry on his dangerous schemes in the affair which so lately agitated the British public, and it was privately reported, when I left London, that in consequence of his plans of policy failing, his share of the mine had been transferred to other hands. Whether it fully answered the expectations of the speculators, I have not been informed with dependable certainty, but I have heard that it had done so. I was at the mine, saw the ore, brought a specimen therefrom, and have seen one exactly similar, said to be found somewhere in this country. It was given, to the best of my recollection, to Dr. Hayne, by a native, who reported that he found it among hills somewhere in the Cummun country. In my late excursion, I have heard of a person acquainted with the situation, and who has some of the ore in his possession. The increase of excessive heat and a temporary illness prevented me from proceeding to the place ; but as the ore I have seen was the steel-grained, and very similar as before noticed to the Cornwall ore, there are reasonable grounds to conclude, it may prove as rich in silver as that is said to be.

I was informed by several old and respectable inhabitants of Cornwall, that of all the mines which were opened in that country for many years past, one-half of them had failed : the other moiety had been successful, and that immense fortunes had been realized by the successful speculators ; while those who had been less fortunate, had been completely ruined : sometimes, they observed, that several successful mines had been opened in succession, but it had also often occurred, that as many had failed ; the fair average in all cases, however, they appeared to have decided, was as before stated.

The districts I have been in may be justly designated the Cornwall of India, but with all external appearances, decidedly in their favor. Here is little difficulty in ascertaining where a mine may be found, symptoms entirely unequivocal crop

almost every where upon the surface, and wherever the earth has been opened where copper has been indicated, its ore has been invariably found. Ashton has opened four within a short distance of each other, near a village called Gurmany-penta, and I have been informed by people he employed, ore in abundance was found: he did not abandon them on account of failure in this instance; but in consequence of water pouring in faster upon his endeavours, than he had the means of clearing: and the last he opened, which seemed the richest, was given up in consequence of one of his people being seriously injured by the falling in of a part of the mine; but from what I have observed on the site of Ashton's proceedings, it is evident he had not sufficient knowledge of the business he had undertaken ever to have effected any thing of consequence in a work of this nature.

In addition to the mines attempted by Ashton, I have found the following, all of which are of fair promise, and some of them remarkably so, near a village called

P — a, 1

O — r, 2

N — a, 1

S — a, 1

Could I have proceeded I should have discovered many more: one only of these I opened, and the prospect is most encouraging. Though I sunk no further than about ten feet, the ore increased in quantity, and I have no doubt, if followed, the mine will be found as abundant as could be desired, even by the most sanguine expectations.

The veins or masses of ore I am certain lie deep, because it does so in all the mining countries of Europe; and from observations I have made, it appears every where to lie far beneath the general level of the earth: but there are perhaps few places known in any country, where ore, in such plentiful indication on the surface, can be found, as in the part of the country I have examined.

Twenty mines may be opened here simultaneously at a much less expense than one could in Cornwall; and should one-half of them fail, the other would realize all expectancy:

but the great chances in my opinion is, that they are all connected, one with the other, and if so, all in some degree would ensure success.

In every place I have seen, there is reason to believe, water will be found at 10, 12, 15, or 20 feet deep; if ever then mines are wrought with effect, entirely efficient means to get rid of it must be the primary object.

If steam engines could be obtained in the country, their great consumption of fuel would prohibit their use; but the country Pacota, by a simple combination of them, stage above stage, will enable water to be thrown to any required height; and by multiplying their number in each stage, they may be brought to equal the steam-engine in power as an hydraulic machine, though they would not compete with it as a first mover.

I have said, all copper mines are deep-seated below the level of the earth, they are said by mineralogists to be seldom found but in primitive rocks: these are of course the basis of all mountains, and as further illustrations of this, the Cornish mine, which I before mentioned, although found originally on a hill, did not offer any thing further than indication of metal, until the shaft had been sunk considerably below the surface of the surrounding country.

From this and what has been already stated, it cannot be expected that any material quantity of ore will be found in any other situation; both science and skill will therefore be required to obtain it, to sink the shafts, and construct the galleries with security, and some simple and effectual means to raise the ore from the mines, and afterwards to melt and cast it into marketable copper.—Ashton's deepest mine may be 30 feet, and water had not materially obstructed him; he however, to disencumber himself from such as did obtrude, only sunk an adjoining well to drain it off. This could not possibly have the effect intended, unless he had adopted means to empty the well, as the water would soon find the same level in the one, as in the other; but not having done this, all his labour proved fruitless. This mine, however, from the information I have received, had already produced

either a vein or mass of ore, the passage to which he has carefully built up with stones.

The more material obstacles which offer themselves are, the variety of soil, which, every place I have seen, is similar ; it appears to be entirely debris from former mountains, and is composed of various earths, and differently constituted strata, and stones of all shapes and sizes. The earth is for the most part loose and friable. The rocks variously constituted, but principally of gneiss or mica-slate, and a species of slate which I have named shorelite ; some however are of quartz, felspar, sienite, and granite : in the loose earth, shoring must be resorted to, and all the rocks, excepting the mica-slate, will only yield to the efforts of gunpowder. In all this variety of rocks, I have found copper.

Timber is scarce all over this part of the country, and galleries cannot be rendered of use without it, or a substitute of equal efficacy. The latter is fortunately at hand, and the mines themselves will afford it in abundance : most of the rocky strata below the surface are of a slaty nature, easily split and divided into any form ; they will therefore answer every purpose, even better than timber : it being firmer, less elastic, and more to be relied upon as effectual support.

From what has been said, it is evident these mines could only be opened with effect by a Company, or the Government ; if by the former, they must possess the protecting power of the latter, and their police must be extended to all the works : the necessity of this becomes obvious, when their situation in the country is considered, where secure store-houses cannot be easily or promptly erected, and where the metal, when in a marketable state, will in all respects be equivalent to cash, and adverting to paragraph 22, literally so.

Were these mines opened on an extended scale, there can be little doubt of their producing advantages of great consequence : on these grounds, I should conceive it entitled to the serious consideration of the Government, as a transaction of more importance to their pecuniary interests, than any perhaps before contemplated, particularly as a few months would ascertain the nature and probable extent of future

prospects, and at an expense of no consideration. Should they turn out, according to every rational expectation, (and I conceive it only possible they will not,) a source of riches will be attached to the state, beyond every other they have heretofore enjoyed from other commercial or manufacturing speculations.

That this country is rich in metals, a doubt I think can hardly be entertained, perhaps containing them in as great abundance as South America ; and that a Government of such extent, riches, greatness, intelligence, and power, should have allowed it to remain so long, without causing it to have been regularly metallurgically and mineralogically surveyed, is a matter so anomalous to their high wisdom, that I confess myself without the power or means in any way whatever to surmise or account for it.

Both these great objects may be accomplished at a comparatively small expense, and should my humble abilities be considered equal to such a performance, and to open the copper mines, at the same time, I am willing to undertake the whole, and to submit plans and estimates of the probable expense they will incur, all of which, and greatly more, I have no hesitation in concluding would in a few months be amply repaid by the produce of the copper mines. Should a plan of this nature be determined upon, I may venture to pledge myself, that as much benefit on the one hand in a commercial view, and, as much honor on the other, in a scientific one, will accrue to the Government, as ever has arisen out of any transaction of a pecuniary nature, they have been engaged in, since they have swayed dominion as a sovereign state.

The ores of this copper will afford the metal in a pure state, at an expense greatly inferior to the expenses incurred in Europe, as it requires only one smelting, whereas, before it can be brought to the same state in Europe, it requires *many* ; in some places, it is smelted fifteen times, before it becomes pure copper. The Indian copper then is at once in a fit state for coining into money, and copper coin being extremely scarce in the districts I have been in, and likely in most others, great embarrassment is experienced,

by the ryot in particular, but also by others, for want of this minor exchange ; coining a copper currency then, at or near the mines, would prove an advantage to the revenue not readily estimated : a simple apparatus, with the metal in the first instance, cast into convenient ingots, would establish this, reserve the charge of bringing copper coins from England, and the expense of carriage, involving itself in the advantages gained, would, together, amount nearly to rendering all the money thus coined a clear gain.

It being certain, that the Nellore and Cuddapah districts, and the Guntoor Circar, abound in copper, it is by no means then irrational to expect it in the same parallel even from Nellore to Nepaul ; as accounts have been published of mines being worked for copper in this direction, and from what I have myself observed, heard, and read, there are strong grounds for the inference, that from Cape Comorin to the Himalaya mountains, perhaps far beyond them, a parallel will be found constituted chiefly of metalliferous strata, rich in metals of every description. The surface of the earth, in a north and south direction, is for the greater part, where plains exist, evidently the basis of a former chain of mountains, now in many places converted by the natural progress of nature into levels ; indeed wherever excavations have been made, this is demonstrated. There is every promise then, if the country were surveyed in the manner I have suggested, to conclude, that the immense advantage of a districtal copper coinage might be extended through nearly the greater part of the Company's dominions, and at a trifling incipient expense, which would in a comparatively short period be reimbursed, and a permanent source of wealth established.

I experience a conviction on my mind there is little speculation in these ideas. I have seen and attentively examined Cornwall, the source perhaps from whence the grandeur of Britain has been drawn ; but I have seen in this country such prospects as have never been seen in that or any other part of England. Every appearance in the range I have examined, seems to say, Search, reward is certain.

I shall conclude this with observing, that I can never con-

sider the British Government will ever act with such ill-advised and fatal imprudence as to deprive the Company of their Charter; for should they do so, the loss of the British Empire in the East will date its downfall from the day Great Britain assumes exclusive dominion over this country, or dominion in any form save that delegated to the East India Company. My reasons for this opinion are too extensive to detail on this occasion: they are obvious, however, to all who have attentively, and without prejudice, or other less excusable views considered the subject, and will at an early period be demonstrated, should ever the fatal arrangement happen; but I take it for granted, such an event can never occur, until the British Government foregoes all its established sagacity and wisdom: but as this is an event not likely to take place, I shall consider the Company's Government permanent, and considering it so, if I should prove the means of opening the riches contained in the hidden recesses of their extensive territory, and of having the country metallurgically and mineralogically surveyed, I trust I shall not be considered vain if I should think that I have done something so materially conducive to the Company's interests, as to be entitled at least to remembrance.

(Signed) B. BISHOP.

A true Copy,

(Signed) T. R. WHEATLEY,
Secretary to Government.

A true Copy,

C. A. KERR.

REVENUE DEPARTMENT.

No. 352.

*Extract from the Minutes of Consultation, under date the
18th April, 1834.*

The Governor in Council proceeds to take into consideration the following letter from Mr. De Fondclair, with reference to the Minutes of Consultation, dated 25th October, 1833.

(Here enter 29th January, 1834. No. 84.)

1. The Governor in Council is pleased to authorize the grant of a lease for 21 years to De Fondclair and Co. of all the mines of copper ore, in lands belonging to Government, in the Talooks of Duppaud, Cumabum, Giddalore, and Budwail, in the district of Cuddapah and Callagherry, Kavalu, Duttalore, and Buddapoody, in the district of Nellore, with a preference of renewal, if approved by the Court of Directors, on payment of a fine, the amount of which shall be determined, in the event of competition, by taking an average of all the offers, and deducting therefrom 25 per cent. ; or if there be no competition, by the award of three arbitrators, one arbitrator to be chosen by Government, another by the Company, and the third by the first two, upon inspection of the accounts of the Company for the last five years of the lease, allowing an advantage of 25 per cent. to the Company.

2. The Governor in Council is further pleased to resolve, that the produce of the mines that may be worked by De Fondclair and Co. in the said Talooks, shall be entirely exempt from any duty or impost whatsoever for the period of ten years from the date of the lease; and that thereafter, the amount of duty or impost to be levied on such produce, either crude or manufactured, shall not exceed ten per cent. of the value, according to the authorized 'Tariff' of the district in which the levy shall be made. It will be at the option of the Government to direct duty to be levied either upon the raw produce of the mines, or upon the copper prepared

therefrom, as may be deemed fit, subject to the above limitation.

3. All machinery, whatever, British or foreign, imported for the purpose of being employed in the mines worked by De Fondclair and Co., and all timber and stores imported for the same purpose, during the period of this lease, shall be exempted from duty, on the same being properly certified to the officers of customs.

4. As the sole object of Government, in granting this lease, is to give encouragement to active exertions directed to develop and bring into use the mineral wealth of the country, it is necessary to provide, that unless effective measures are taken and followed up for the purpose intended, it shall not be allowed to stand in force, that so it may not be obstructive of the efforts of others, if from any cause the present Company should fail to pursue their undertaking with the spirit and energy necessary to render it successful. The Governor in Council, therefore, resolves to make the following conditions, viz. that at the expiration of three years from the date of the lease, it shall be incumbent upon De Fondclair and Co. to shew, that they have established, and are working mines, for raising copper ore by means of machinery, within the limits assigned to them in both the districts of Cuddapah and Nellore, and to prove by their accounts, that they have actually raised therefrom, and exported a quantity of copper ore, calculated to yield 400 tons of copper metal, or that they have expended in their operations, and in the purchase of machinery, &c. not less than 3,00,000 Rupees; that they shall continue to carry on their mining operations in both districts, and at the end of the next two years, shall prove by their accounts, that they have raised and exported, within that period, a quantity calculated to yield 1,000 tons of copper; and at the end of the next five years, that they have raised and exported, within that period, a quantity calculated to yield 2,500 tons of copper; producing fair samples of the ore exported, and exhibiting the actual out-turn of the sales effected by the Company. If they carry on the operation of smelting the pro-

duce, as well as mining, that they shall export or have ready for export within the first period, 400 tons of copper, within the second period, 1,000 tons, and within the third period, 2,500 tons.

5. It shall be a further condition, that the Company, in their mining operations, shall not enter or encroach upon cultivated or arable ground, without the licence of the collector, which shall not be granted until they have made full compensation to the occupant, and entered into an agreement to pay the regulated assessment to Government at the usual periods. The compensation to be paid to the occupant shall be determined by the collector, if there be any dispute, and generally all disputes relative to the occupancy of lands by the Company, under this lease, shall be determined, so far as the Company are concerned, by the collector, subject to an appeal to the Board of Revenue, by whose decision the Company shall abide.

6. The collectors and magistrates in the districts in which mines shall be worked will of course give due support and protection to the servants of the Company, and the people employed in them: but they cannot be permitted to extend to them any unusual privileges.

7. The lease shall be granted to De Fondclair and Co., their heirs and assigns; the counterpart of the lease shall be executed by the existing members of the Company, and no assignment shall be made of the interest vested in them respectively, or of any share thereof, to any other party, without a notice in writing being given to the Chief Secretary to Government one month previously. Provided that nothing in the lease to be granted shall be constructed to authorize the stay or residence of any member of the Company in India, or any part thereof, contrary to the intent and meaning of any Law or Regulation made, or without lawful licence.

8. On failure of any of the conditions, the lease shall be null and void, if the Governor in Council shall so determine.

9. The Governor in Council will be prepared to confirm any leases that the Company may obtain from zemindars, of

the right of mining for copper ores, for a period not exceeding the period of this lease, provided the terms thereof be conformable to the regulations, and to grant a like exemption from duty to the produce of the mines worked under such leases, and to the machinery, &c. imported for working them, as is mentioned above.

A true extract,

(Signed) D. ELLIOTT,

Officiating Secretary to Govt.

A true copy,

C. A. KERR.

Tract IV. Extracted from Heyne's Tracts on India.

OF THE COPPER MINES IN THE CALASTRY, VENCATAGHERRY, AND NELLORE DISTRICTS, ON THE PENINSULA OF HINDOSTAN.

ABOUT the year 1797, I laid before Government a memoir on the copper mines of Agricondalab, near Innacondah, which I had the good fortune to discover. And since that period, I have been assiduously engaged in prosecuting the discovery, and in ascertaining the nature and value of the Indian copper ore. I propose, in this essay, to give an account of the facts which have come to my knowledge.

In the year 1799, I observed, in the mineralogical collection of Mr. Petrie*, some specimens of mountain green copper ore, about the size of a pigeon's egg, or somewhat larger. Mr. Petrie informed me, that he got them from a black man, who told him that they came from some northern district. In 1800, when at Madras, I was informed, by Mr. Westcott, of copper ore brought to him about two years before, from a place where it was found in abundance, and which, from his description, appeared to me to be of the same nature with Mr. Petrie's specimens. Hence it was not unlikely that both came from the same place. I was told that the ore occurred in a vein which ran through three different countries. Having obtained the Governor's leave to direct my pursuits to the ascertaining of this object on my way to the Mysore, I went from Vellore, northwards, directly towards the principal place of the Calastry country, where I was in full expectation of receiving information on the subject.

At Bomrazepalliam, one of the valleys among those hills through which I passed, the sienite of the more southern

* Now Governor of Prince of Wales's Island.

parts of the Carnatic changes into hornblende, and a kind of trapose iron ore. After having cleared these hills, we come to other ranges, which have all the appearance of being stratified. They are mostly high, and at their summits naked, but continuous, and not so rugged as the more southern sienitic hills. They are composed chiefly of compact felspar. In the lower part of the country, and chiefly the uppermost stratum of loam, there occurs a kind of greenstone, generally so much decomposed, as to have assumed the appearance of pipe-clay. I observed this, especially in the bed of a river near Tripetty, where, at a distance, I took the white beds constituting the banks for white marl.

The prevailing rock of the Tripetty hills is a compact felspar. These hills are pretty high, and run south-east and north-west. But, as I had not an opportunity of ascending any of them, I am unable to communicate any accurate information respecting them, though their structure appears to me to merit attention.

At Vencatagherry, about eight miles from Calastray, where I expected to procure information, I staid three days; but notwithstanding the best endeavours of the collector, I could not obtain any intelligence whatever; and, had it not been for Mr. Petrie's kind endeavours at Madras, and a letter from him directing me to Poecūr, in the Condacūr purgunnah, belonging to the Nellore district, I must have entirely given up the pursuit.

On leaving Vencatagherry, I had the Ghauts on my left. They continued to attend me at some distance, in low connected ranges; and here and there were some insignificant hills and small ranges on the right, or toward the sea. For the first two days the rocks in the low country were mostly foliated hornblende, which at last disappeared, and mica-slate assumed its place. At the same time, the soil became black, and a kind of marbly tuff appeared under it. This change took place when I was nearly in a line with Nellore. The water became then so brackish that it was scarcely drinkable. I do not know whether to ascribe to it, or to the violence of the heat, the serious illness with which I

myself, and the greater part of my followers were attacked ; an unfortunate circumstance, which not only retarded our progress, but almost frustrated our designs.

When I passed Chennūr, a village about twenty miles north from Nellore, I was informed, that diamond mines existed in its vicinity, and that not many years ago diamonds had been found there of the first water, or, as the Hindoos express it, male diamonds. The black soil, and the capacious layers of calcareous tuff below it, may be considered as indirect proofs of the veracity of this assertion.

At Bramhanakaka, a place about ten miles farther north, I obtained the first positive account of the existence of copper mines in that vicinity ; though none of the inhabitants could tell exactly where. Some persons, however, were pointed out, who, about two years before, had carried the ore to Madras. They resided at Caval, six miles from the place where I was. Caval is within eight miles of Ramapatam, a place well known to all travellers, between Ongole and Nellore.

We were informed, that the districts in which the copper mines existed were those of the Calastry and Vencatagherry country, which lie between the Nellore and Guntoor Circars ; and several places were proposed for examination by a man who professed to be perfectly acquainted with them ; and Wangapādu was at length selected as the largest, and the one in which the ore was to be found in the greatest abundance.

Our route from Caval was at first north-west, for about twelve miles, to Gudlūr. From thence we travelled due west to Linga Samūdram, a village belonging to the Vencatagherry district. Here again the Ghauts appeared in view. They resembled those near Tripetty, but were higher. Several smaller ranges may be observed, running in different directions from the principal chain.

From the latter place, the country becomes undulating, jungly, and stony. The stones are chiefly indurated marl and quartz. Where rocks appear, they are composed of hornblende and quartz, with a scanty mixture of garnets.

Near Bombartipādu, a village about twenty-four miles from Tripetty, I found on the road pieces of emery, of the size of a hen's egg, or larger ; which I discovered to have been detached from rocks which appeared at no great distance, and which were composed of hornblende, a good deal disintegrated, and emery. The hornblende had a foliated fracture, and consisted of irregular bundled columnar crystallizations. It was very soft ; the emery was mixed with it, in pieces from the size of a pea to that of a hen's egg, or even larger.

From this place to Kattakindapalle, I found garnets, interspersed in mica-slate and in sienite. I observed marl likewise, both in beds and in veins. Rich diamond mines had been formerly wrought in this place. Round the village several pits were to be seen, that looked not unlike old diamond mines. They were filled with water. The principal bed here was of marl.

Hills now make their appearance on all sides, and at a very small distance. Some few of them stand single, but the greater number are in ranges, which usually run eastward. The most extensive ranges are on the north side of the village, which is about forty miles west of Ongole. The Ghauts, visible to the west, in large connected chains, stretching north and south, send some ranges eastwards, which, with very little interruption or variation in the nature of their constituents, approach the eastern ocean not far from Ongole. To these ranges belong several remarkable hills, as the Chicota, celebrated for the frequent earthquakes originating at it, and spreading over the country ; and the Ongole hill, which seems to influence the compass in an uncommon degree. To them also belong the hills of Wangapādu, which contain the copper mines, the object of my search.

Wangapādu lies rather lower than the country from which we came. The soil round it is black ; whereas at the former places it had been chiefly gravelly and stony. This village is very small. It lies at the foot of a rising ground, and opposite to a range of hills which run nearly east and west, and which abruptly terminate their eastern extremity at this place.

On my arrival, I was astonished to find that my conductor had never been there before, but had proceeded with me upon the bare report that this was the place where the greatest quantity of copper had been found. He was, however, by no means discouraged, but led me to the high ground on the east side of the village, which had been pointed out to him by the villagers. The appearance of this place was not very favourable. We saw merely a few white quartz rocks rising here and there above the surface, and which exhibited no trace of any cupreous efflorescence upon their surface. The soil was red and stony, and covered with small jungle. At last, an inhabitant of the village, with much hesitation, shewed us some rocks that had the appearance of having been broken and excavated, as far as they appeared above ground. He told us, at the same time, that this place went under the name of the *Brass Mines*, and that those of copper were on yonder hills, pointing out a range at no great distance.

Suspecting that my conductor, who was a goldsmith, knew but little of those places, I sent for another person, who was said to be perfectly acquainted with all the copper mines in this neighbourhood. Every one, till this moment, seemed anxious to keep us ignorant of these mines; and, indeed, if we had asked about the most common stone, they would have denied its very existence, though, perhaps, sitting upon it at the very time the question was put to them. This to some may appear an exaggeration, but it is a literal fact, which happened to myself. Being lately at Bomrazepalliam, in a village called Allatū Satrum, where I was visited by the Aumildar and one of the Rajah's Sirdars, I asked, during the course of conversation, whether any limestone could be got there. They hesitated for some time; but, at last, unanimously assured me, that not a thing of the kind could be found in the Rajah's country. Yet, not fifty yards from the choultry, people were picking up limestones out of the black ground; three or four lime kilns were smoaking in our view, and the very choultry itself was a store-house for chunam*. I was told the very same story respecting iron,

* Quick lime.

which they said came from Madras : though, not two miles from the place, there were a number of iron furnaces, where the metal was smelted in considerable quantities. This strange conduct originated in both places from the same cause : the mandate of the Rajah to conceal every thing, as far as possible, from the prying eyes of an European.

The man who had been sent for, made his appearance about 10 o'clock. He was, at that time, an inhabitant of one of the Cummum villages, and therefore under no restraint in this district. He acknowledged that, according to the tradition of his ancestors, (and he was himself an old man,) the adjacent country abounded in copper mines, which he was very ready to point out, though he declared himself utterly ignorant of the ore, and of every thing else respecting it. Being anxious to ascertain a fact of so much importance, I immediately proceeded, in company with him, to the farthest east hill of the above-mentioned range, which was situated on the north side of the village. It was about two miles distant. The nearer we approached, the more stony and jungly did the road become. A foot-path, paved with stones, led up the hill, to the place which was shown me as one of the mines. It was situated two-thirds up the hill, and might be about 400 feet above the level of the village. An open gallery, cut into the rock, demonstrated that it had been formerly wrought. And as the stones, which lay in abundance near it, were all tinged or overlaid with mountain green, there could be no doubt that the ore extracted had been copper.

Many other places containing copper ore were pointed out ; but to acknowledge that I did not go to see them will, I hope, appear to my readers excusable, when I state, as a reason, the very bad state of my health, and the excessive heat of the sun in the beginning of May. Indeed, when I returned to Wangapādu, I was more dead than alive, and was strongly impressed with the idea of approaching dissolution.

Before I went away, some of my trusty servants were dispatched, with the goldsmith, to the place from which he

had got the specimens of copper ore that had been brought to Madras. This place, according to his information, was about sixteen miles off, and not far from Linga Samudram, which we had passed on our way thither. Not being very sanguine in my expectations, I did not go myself; and, indeed, I could hardly have ventured upon such an excursion without the utmost hazard of my life. I went straight on to Ongole, where, the day after my arrival, I was agreeably surprised by the return of the small party I had sent with a great quantity of the richest mountain green, both in solid lumps and in powder. They had been at a village called Yerrapillay, in the Pamoor purgunnah, where they obtained the ore by employing a few men, for six fanams, to dig a hole in the ground, about nine feet deep. The quantity which they brought was sufficient to make about twenty-five pounds of copper. The only stone mixed with it was quartz, which either enclosed it, or was aggregated with it. They informed me that they had found various places round the village which were said to have been worked in former times. They brought, likewise, a piece of heavy slag, shown them as the remains of former smelting of the ore.

I shall now endeavour to give an oryctognostic description of the minerals which prevail in this country, especially of those which exhibit traces of copper ore. I shall attempt likewise a short geognostic account of the country, and mention such other particulars as may enable us to form a competent judgment of what reasonably may be expected, should the mines be again opened, or new ones searched for.

The range of hills which I visited seemed, at first view, to be composed of a kind of hornstone, or compact felspar, which, in many places, assumes a slaty appearance, and might be called siliceous schistus; but, when carefully examined, we find it an aggregate, in which quartz is the prevailing ingredient. This quartz, when it occurs in small grains, is often crystallized and very pellucid; but when in large masses, it is most commonly iron shot, and opaque. Schistose hornblende is the ingredient which exists in the greatest proportion after the quartz. It occurs either in

minute particles, interspersed through the quartz, or in masses of a considerable size. In the latter case, it has a fine black shining colour, and is composed of thin plates, which in the cross fracture have a hackly appearance, but in the opposite direction, are obscurely fibrous. Its streak grey; it is very soft, and its specific gravity is between 2.93 and 3. It has more the appearance of mica than of hornblende; but the specific gravity induces me to consider it as belonging to the latter species, rather than the former: from this description, there can be little doubt that the rock is a variety of mica-slate. Mountain green enters into the composition of this rock here and there in particles, sometimes scarcely visible, sometimes of the size of a pea, sometimes in large masses, constituting nests in the rock.

Quartz makes its appearance in the rocks on the rising ground south of the village; it was of a milk-white colour and opaque, but in every other respect, resembled common quartz; it probably constituted a bed in the mica-slate.

Mica-slate appears in the low country wherever the ground is laid open to a certain depth; as where wells have been dug in the villages, &c. Its colour is bluish grey and silvery, with black round dots; lustre, shining and semi-metallic; opaque; texture undulating, large foliated, somewhat uneven: it is not easily split into lamellæ, though this may be done. It is almost every where intersected with marlaceous tuff, or what might be called semi-indurated earthy limestone. This mineral in the low country indeed seems to form a regular and general bed immediately under the soil: it has the appearance of marl, is greyish white, porous, knobby, breaks with an earthy fracture, effervesces strongly in acids, and does not stick to the tongue. This bed is always covered by one of black mould, and where the mould is supported by gravel or stones, local causes may be easily assigned, as the vicinity of a decomposing rock, or the elevation of the ground from which the rain has carried away all the fine vegetable and decomposed particles. This marl never contains any petrifactions or remains of marine products. When it happens to be mixed with any quantity of gravel or iron ochre, it dis-

poses the whole to harden to a considerable degree : this is the case at the Red Hills near Madras, at Nellore, and at various places in this neighbourhood, especially near Cavalry. When this marl has a considerable thickness, which is seldom the case, and is mixed with large pebbles, incrustated with ochre, diamonds are very often found under this stratum.

It renders the water which runs through it brackish : hence it happens that in all parts of India, which have a black soil, we find the water of the wells and rivulets nauseous ; and on examination, it is found impregnated with common salt, or muriate of lime : in many parts of the Nellore district, it seems to hold pure lime in solution, for it has the taste and smell of lime-water.

Fortunately for the inhabitants, these depositions of lime are generally found in the lowest parts of the country, through which the larger rivers take their course ; from these rivers, the inhabitants are enabled to procure water for culinary purposes. The well water in these districts is unhealthy, and all disorders which may be traced to that source are more common in such countries than in any others.

There is always a bed of black mould lying over the calcareous bed ; the formation of this mould, I conceive, is owing to the energy with which the lime attacks all vegetable substances, and reduces them to soil : the plants which spring up in the rainy season are destroyed by the lime during the warm dry weather that follows : even the strong stubble of the Jonna is incapable of withstanding this powerful action, but is soon reduced along with the other vegetable bodies to a fine soft mould. This mould, while it continues moist, is remarkably favourable for the growth of plants. The *Mimosa Arabica*, *Jatropha glauca*, *Cassia auriculata*, and *Cassia senna*, var. are the only plants that flourish in it during the hot season : many, however, spring up in it during the rainy season. They must all arise from seeds, for no traces of the roots of any of them can be discovered before the rains begin : thus it appears that the seeds of plants are capable of withstanding the decomposing energy of lime much better than the roots ; a curious fact not easily accounted for.

From the preceding statement, it appears, that the mountains in this country are primitive, and consist chiefly of mica-slate ; the other rocks which occur in them are probably subordinate, and seem in some measure connected with primitive trap. The lime and marl in the low country is no doubt of very late formation, and probably originated from depositions of stagnant water, with which the country at one time was probably covered. Several of the copper mines seem to be situated immediately under the bed of marl.

All accounts agree that the working of these mines have not been given up for want of ore, but from the jealousy of the Rajahs, who wished to hide such a treasure as long as possible from their superiors. It was, therefore, with the greatest reluctance that I could prevail upon any of the inhabitants of these places even to speak of it. The copper mines at Agricondah are not far off, and probably are connected with those which I have just been describing ; they are situated in a fine clay-slate, which I conceive a more favourable rock for containing rich copper ores than those we meet with here. The extent of country through which this ore is distributed is a good symptom, as it shows us that the quantity of ore must be very considerable.

The general use of copper or brass utensils among the natives of Hindostan, and the preference given to them before all other descriptions of vessels, together with the tenacity with which they adhere in every point to the customs of their forefathers, seems to me a very strong proof that copper has been formerly obtained in India in considerable quantity. The constant wars in which the native princes have been engaged, and the consequent depopulation of this part of the country, are probably the true causes why these mines have been so long neglected.

It appears probable, from the information I obtained, that the copper ore occurs in veins, and that quartz is at least frequently the vein stone ; but I had not the means of ascertaining either the size or direction of these veins. I have no doubt myself, that the size is considerable, and that the copper ore might be obtained in great abundance ; but it would

be requisite to determine this point by an actual survey before the East India Company make any attempt to work the mines.

As to the nature and richness of the ore, these have been determined. Specimens of it were sent to London. It was analysed by Dr. Thomson, who found it a new species of copper ore, which he called *Anhydrous carbonate of copper*.

It differs from the two carbonates of copper at present known, in the absence of water. Both of the former specimens are hydrates; the one containing carbonate of copper combined with one atom of water, the other with two atoms. The following are the constituents of this ore, according to the analysis of Dr. Thomson:

Carbonate acid,	16·70
Black oxide of copper,	60·75
Red oxide of iron,	19·50
Silica,	2·10
Loss,	0·95
	<hr/>
	100·00

Thus it contains half its weight of metallic copper; a very unusual proportion for the ores of this metal, which are generally poor. If we were to suppose the oxide of iron to be accidentally present, and not to pervade the whole vein, in that case the proportion of copper would be increased about a fifth, or would amount to about sixty per cent. The carbonic acid gas is driven off by roasting the ore, so that when the roasted ore is smelted, and specimens are chosen quite free from quartz crystals, the metallic copper amounts to at least sixty per cent. of the whole.

This ore possesses another advantage over copper pyrites, the usual copper ore in Great Britain, and indeed in every part of Europe where copper mines occur—it is more easily smelted and reduced to the metallic state; so that the expense of smelting it would not be so great as usually incurred in similar cases.

All these considerations render these copper mines of sufficient importance to draw the attention of the British Government in India; if they were wrought with skill and success, they would not only be the source of a considerable revenue, but would greatly benefit the country; and from the total absence of lead, antimony, and arsenic, they would probably produce a copper of sufficient purity to be used as an alloy of gold.

Malachite and mountain green probably constitute the great mass of the ore in the copper veins, but an immense nest of the anhydrous carbonate of copper was found at Ganypittali, a village belonging to a Jaghierdar in the Ven-catagherry district, about 40 miles west of Ongole. It exists there in a rock of the nature of gneiss, but considerably disintegrated, and the quantity of it must be immense, as forty coolies' loads were procured by a little digging, and sent to Mr. Travers, the collector for the district, and almost as much remained which had been dug out, but was not carried away.

A true copy,

C. A. KERR.

A P P E N D I X.



[FROM MCCULLOCH'S DICTIONARY OF COMMERCE.]

BRITISH COPPER TRADE.

GREAT BRITAIN has various copper mines, in Cornwall, Devonshire, Wales, &c. but particularly in the first. Though known long before, the Cornish copper mines were not wrought with much spirit till last century. From 1726 to 1735, they produced at an average about 700 tons a year of pure copper. During the ten years from 1766 to 1775, they produced at an average 2,650 tons. In 1798, the produce exceeded 5,000 tons; and it now amounts to about 12,000 tons worth, at £100 a ton, no less than £200,000 sterling! In 1768, the famous mines in the Parys mountain, near Amlivich, in Anglesea, were discovered. The supplies of ore furnished by them were for a long time abundant beyond all precedent; but for many years past, the productiveness of the mine has been declining, and it now yields comparatively little copper. At present the mines in Anglesea and other parts of Wales yield from 1750 to 2000 tons of copper; those of Devonshire yield about 500 tons; the quantity produced in the other parts of England being quite inconsiderable. The Irish mines produce about 500 tons. Those of Scotland never were productive, and have been almost entirely abandoned. The entire produce of the empire may, therefore, be estimated at present at from 14,500 to 15,000 tons.

In consequence of the greatly increased supplies of copper that were thus obtained, England, instead of being, as formerly, dependent on foreigners, for the greater part of her supplies of this valuable metal, became, previously to 1793, one

of the principal markets for the supply of others. And notwithstanding the vastly increased demand for copper during the war, for the sheathing of ships and other purposes, the exports continued to increase and the imports to diminish; the greater productiveness of the Cornish mines having sufficed not only to balance the increased demand, but also to make up for the falling off in the supplies from Anglesea.

Owing to the want of coal in Cornwall, the ores are not smelted on the spot, but are, for the most part, sent to Swansea; it being found cheaper to carry the ores to the coal than the contrary.

Account of the Copper produced from the mines in Cornwall since 1800, showing the quantity of ore, of metal, or fine copper, the value of the ores in money, the average percentage or produce, and the average standard or miner's price of fine copper, made up to the end of June in each year.

Years.	Quantity of ores.	Metal or fine copper.	Value of the ores.	Produce of ores per cent.	Average standard price per ton.
	Tons.	Tons. cwt. qrs. lbs.	£ s. d.		
1800,...	55,981	5,187 0 3 7	550,925 1 0	9½	133 3 6
1801,...	56,611	5,267 18 3 10	476,313 1 0	9½	117 5 0
1802,...	53,937	5,228 15 3 5	445,094 4 0	9½	110 18 0
1803,...	60,566	5,616 16 0 21	533,910 16 0	9½	122 0 0
1804,...	64,637	5,374 18 1 20	507,840 11 0	8½	138 5 0
18 5,...	78,452	6,234 5 0 6	862,410 16 0	7½	169 16 0
1806,...	79,269	6,863 10 2 13	730,845 6 6	8½	138 5 0
1807,...	71,694	6,716 12 1 26	609,002 13 0	9½	120 0 0
1808,...	76,867	6,795 13 2 25	495,303 1 6	10	100 7 0
1809,...	76,245	6,821 13 1 19	770,028 15 6	8½	143 12 0
1810,...	66,048	6,682 19 1 27	570,035 8 0	8½	132 5 0
1811,...	66,786	6,141 13 3 7	556,723 19 0	9½	120 12 0
1812,...	71,547	5,720 7 2 4	549,665 6 6	9½	111 0 0
1813,...	74,047	6,918 3 0 6	594,345 10 0	9½	115 7 0
1814,...	74,322	6,369 13 3 7	627,501 10 0	8½	130 12 0
1815,...	78,493	6,525 6 3 25	552,813 8 6	8½	117 16 0
1816,...	77,334	6,697 4 0 17	447,959 17 0	8½	98 13 0
1817,...	76,701	6,498 2 0 16	494,010 12 6	8½	108 10 0
1818,...	86,174	6,849 7 1 1	686,005 4 6	7½	134 15 0
1819,...	88,736	6,804 2 2 7	623,595 4 6	7½	127 10 0
1820,...	91,473	7,508 0 3 26	602,441 12 0	8½	113 15 0
1821,...	98,426	8,514 19 2 12	605,968 19 6	8½	103 0 0
1822,...	104,523	9,140 8 3 20	663,085 13 6	8½	104 0 0
1823,...	95,750	7,927 17 2 7	608,033 1 0	8½	109 18 0
1824,...	99,700	7,823 15 1 10	587,178 3 6	7½	110 0 0
1825,...	107,454	8,226 3 0 21	726,353 12 0	7½	124 4 0
1826,...	117,308	9,062 12 3 15	788,971 15 6	7½	123 3 0
1827,...	126,710	10,311 14 3 15	745,178 1 0	8½	106 1 0
1828,...	130,366	9,921 1 2 11	756,174 16 0	7½	112 7 0
1829,...	124,502	9,656 10 3 4	717,334 0 0	7½	109 14 0
1830,...	133,964	10,748 0 0 0	773,846 0 0	8	106 5 0
1831,...	144,402	12,044 0 0 0	806,090 0 0	8½	100 0 0

Exports of British Copper since 1820.

Years.	Unwrought.	Coin.	Sheets, Nails, &c.	Wire.	Wrought Copper of other Sorts.	Total of British Copper exported.
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
1820, ..	44,155	10	58,121	8	22,663	121,958
1821, ..	31,543	155	66,676	21	24,035	125,431
1822, ..	25,829	..	65,070	40	22,731	113,671
1823, ..	24,082	802	56,146	98	25,387	105,516
1824, ..	19,209	95	62,920	292	23,580	106,096
1825, ..	10	2,134	51,437	40	25,002	78,624
1826, ..	2,604	1,807	63,264	11	26,307	95,994
1827, ..	26,583	1,450	74,943	8	40,439	143,424
1828, ..	21,591	1,150	52,412	71	48,897	124,121
1829, ..	52,978	15	59,871	13	46,643	159,521
1830, ..	56,722	640	66,331	16	56,443	183,154
1831, ..	67,200	96	70,477	149	32,610	170,613
1832, ..	77,497	2	79,944	13	37,155	194,612

N. B. The foreign copper imported is altogether intended for re-exportation. In 1832, 13,894 cwt. of copper were smelted from foreign ore. The East Indies and China, France, and the United States, are the great markets for British copper. The exports to these countries, in 1832, were respectively 82,880, 35,984, and 31,235 cwt.

For the following details, with respect to the state of the British Copper Trade in 1830, we are indebted to Mr. Pascoe Grenfell, who is largely engaged in it, and on whose accuracy every reliance may be placed :

“ The quantity of copper produced during last year (1830) in Cornwall, from ore raised in that county, exceeded *ten thousand tons* of pure metal ; and if to this be added what has been produced in Wales, in other parts of England, and in Ireland, the whole quantity of *fine* or *pure* metal produced in the United Kingdom, in 1829, may be fairly stated at *twelve thousand tons*.

“ The quantity of British copper exported in 1829 amounts, according to an account recently laid before the House of Commons, to 7,976 tons of fine metal : to which, adding the exports of foreign copper, the total export was 8,817 tons. The copper imported is altogether intended for re-exportation. I cannot state its precise quantity in fine metal, because the greater part of it arrives in a state of *ore*, and I have no means of knowing the produce in pure metal of that ore, beyond such part of it as may come into my own possession.

The value of the 12,000 tons of copper produced in the United Kingdom, as above stated, at £90 per ton, is £1,080,000."

Foreign Copper.—Copper ores are abundant in Sweden, Russia, Persia, Japan, China, Chili, &c. Near Fahlun, in the province of Dalecarlia, in Sweden, is the celebrated copper mine of the same name, supposed to have been wrought nearly 1000 years. For a long time it was one of the most productive mines in the world. Towards the beginning of the seventeenth century, it yielded an annual produce of 8,000,000lbs of pure metal; but it has since greatly declined; and it is most probable that at no distant period it will be wholly abandoned.—(Thomson's Travels in Sweden, p. 221.) There are still, however, several productive copper mines in other parts of Sweden. The exports of copper from Stockholm, amounted to 4,336 skip pounds, or 723 tons English, besides the exports from Gottenburgh and other ports. The product of the copper mines in the government of Olonetz, in Russia, is estimated at 210,000 poods, or 3,375 tons (English a year. (Schnibzer, Essai d'une Statistique Générale, &c. p. 41.) The copper mines of Chili are also very rich, and their produce is at present imported into Canton and Calcutta direct from Valparaiso. The copper mines of Japan are said to be among the richest in the world. The Dutch annually import about 700 tons of their produce into Batavia; and the Chinese, from 800 to 1,000 tons into Canton and other ports; in fact, Japan copper is spread over all the East, and is regularly quoted in the price currents of Canton, Calcutta, and Singapore. (See p. 245.) It is purer, and brings a higher price, than any other species of bar or slab copper. It is uniformly met with in the shape of bars or ingots, very much resembling large sticks of red sealing-wax. When the copper of South America is worth in the Canton market from 15 to 16 dollars per pecul, that of Japan fetches from 18 to 20. Pretty considerable quantities of copper are imported into Calcutta from Bushire and Bussorah. This is mostly the produce of the Persian mines; but a little is understood to come from the Russian mines in Georgia.

Customs, Regulations.—Old copper sheathing, old copper, and pewter utensils of British manufacture, imported from British plantations, and also old copper stripped off vessels in ports in the United Kingdom, may be admitted to entry, duty free, under the following regulations; viz. 1st, old copper sheathing, stripped off British vessels in ports in the British possessions, upon proof to the satisfaction of the commissioners of customs, that such sheathing was stripped off in such ports, and also that the said sheathing is the property of the owner of the ship from which it was so stripped, to be delivered to such owner.

2nd. Old copper sheathing, stripped off any ship in any port in the United Kingdom, upon the fact being certified by the landing-waiter superintending the process; the old copper to be delivered only to the copper-smith, who may recopper the vessel from which the copper was stripped, he making proof to that fact.

3rd. Old worn-out British copper and pewter utensils to be in all cases delivered when brought from British possessions abroad in British ships, upon the consignee submitting proof that they had been used on a particular estate, and are consigned on account of the owner of that estate, and that he (the consignee) verily believes them to have been of British manufacture. (*Min. Com. Cus.* 15th of Feb. 1833.)

Copper ore may be taken out of ware-houses, to be smelted, on proper notice being given to the customs officers, and giving sufficient security, by bond, for returning the computed quantity of fine copper in it.—(7 & 8 *Geo.* iv. c. 58, § 23.)

Copper is in extensive demand all over India; being largely used in the dock-yards, in the manufacture of cooking utensils, in alloying spelter and tin, &c. The funeral of every Hindoo brings an accession to the demand, according to his station; the relatives of the deceased giving a brass cup to every Brahmin present at the ceremony, so that 5, 10, 50, 100, 1000, and sometimes more than 10 times this last number, are dispensed upon such occasions.—(*Bell's Commerce of Bengal.*)

MINERAL KINGDOM.

COPPER.

THIS metal was one of the earliest with which man became acquainted, and from very remote times, it has been used for various instruments and utensils of domestic life. It is, after iron, of all metallic bodies the most generally useful in the arts, both in a state of purity and in combination with other bodies. It constitutes one of the most valuable and important products of the mines of the United Kingdom.

The appearance of pure copper is so familiar to every one as to need no description. With the exception of the rare metal titanium, it is the only metallic substance of a red colour. Its specific gravity is 8·89, or nearly nine times heavier than water; it is a little heavier than iron, and not quite so much so as silver. It can only be melted at a very high temperature, but is more fusible than iron; it may be beat into thin leaves, and, next to iron, possesses the greatest tenacity of all the metals; for a wire one-eight hundredth part of an inch in thickness will support a weight of three hundred and two pounds, without breaking. Its hardness is greater than that of either gold or silver; it is the most sonorous of all metals, and is therefore used for making cymbals, many wind instruments, and bells. It is capable of forming alloys with other metals, but in that combination, remarkable changes sometimes take place. Thus, when alloyed with tin, which is also a ductile metal, the mixture (bell-metal) is quite brittle: on the other hand, when united with zinc, which is a brittle metal, the mixture (brass) is nearly as ductile as the pure copper.

Ores of this Metal.—Copper is found in a state of purity, or that form which mineralogists call *native copper*, and also in combination with other mineral substances, constituting a great variety of ores. These may be divided into two great classes: in the one, the copper is combined with sulphur and other metals in various proportions, or with oxygen; in the other class, it is in the state of an oxide, combined with acids and with water. The following tables show the great

variety of composition which is to be found in the ores of this metal. They exhibit the results of analysis by different chemical philosophers, omitting, however, the more minute fractional parts. The figures express the number of grains of the substance at the head of the column, which are contained in a hundred grains of the ore.

	Copper.	Sulphur.	Iron.	Arsenic.	Antimony.	Oxygen.
Yellow Copper Ore.....	30	35	32	..	..	..
Purple do.....	61	24	14	..	..	..
Vitreous do.....	81	19	..	..	..	..
Gray do.....	53	24	23	..	..	..
Arsenical Gray do.....	43	10	28	15	..	..
Antimonial do. do.....	38	28	3	..	22	..
Red Oxide of Copper.....	91	..	..	..	..	9

	Oxide of Copper..	Water.	Sulphuric Acid.	Muriatic Acid.	Phosphoric Acid.	Arsenic Acid.	Carbonic Acid.
Blue Carbonate of Copper, ..	69	5	..	..	..	..	26
Green ditto,	72	9	..	..	..	..	19
Sulphate of Copper,	33	36	31	..	..	..	..
Muriate of do.	73	17	..	10	..	..	..
Phosphate of do.	69	..	..	..	31	..	..
Arseniate of do.	49	35	..	..	..	14	..

Native copper is of common occurrence, but seldom in large quantities together in one spot. The finest specimens for museums are brought from the mines of Siberia, on the eastern side of the Oural Mountains, from Hungary, and Saxony, and very good specimens are occasionally met with in Cornwall. It is found in considerable quantity in Brazil, and also in Japan, and it is obtained rather abundantly in the vicinity of the Copper Mine River in North America. Masses of it have been found in Canada of more than two hundred pounds weight.

More than nine-tenths of the copper of commerce is obtained from those ores in which the metal is combined with sulphur and iron, and the yellow copper ore is the most abundant of these. The other combinations of the metal frequently accompany the sulphurets, but are rarely found in sufficient quantity to be smelted by themselves. The quan-

tity of copper contained in the sulphurets is very variable, on account of the intermixture of stony and other foreign ingredients, and an assay of the ore can alone determine its value. In some mines, the ore does not contain above 3 per cent. of pure copper, and yet it pays for working. The poorer kinds of ore are chiefly sulphurets of iron, or iron-pyrites, containing copper; while the richer kinds are sulphurets of copper, or copper-pyrites, mixed with iron and arsenic in different proportions.

A considerable quantity of copper is obtained from springs containing sulphate of copper, or blue vitriol, in solution, which are frequent in copper mines, or in hills where the sulphuret occurs, the decomposition of the ore by the action of the air and of water changing the sulphur into sulphuric acid, which enters into a new combination with the metal. The copper is obtained by immersing plates of old iron in the fluid: the acid, having a stronger attraction for iron than for copper, quits the latter, and combines with the iron, leaving the metallic copper on the surface of the iron plates, and it is then scraped off. This process may be easily seen by dissolving a little blue vitriol in water, and if the blade of a table-knife be dipped in the solution, in the course of a few minutes it will have a bright coating of metallic copper. This is one of the most ready and correct tests for discovering if any of our food be poisoned with copper, which sometimes happens if fatty substances or acids be allowed to stand in a copper vessel not properly tinned.

A variety of the green carbonate of copper, called malachite by mineralogists and jewellers, is used for ornamental purposes; it is bright green and opaque, and is found in solid rounded masses. When these are cut through, they have a waved and silky appearance, with a great variety of tints, from dark to pale green; the structure very much resembling that of the calcareous deposits from petrifying springs, called stalagmites. The finest specimens of malachite come from Siberia, from a mine not far from Ekaterinbourg; and masses have been found of such dimensions as to afford slabs for tables. There was some time ago in a

muscum at St. Petersburg a slab thirty-two inches long, seventeen broad, and an inch thick, which was valued, according to Patrin, at 20,000 francs, or about 800*l*. When set in chased gold, it has a rich and beautiful effect in necklaces and ear-rings. Vessels are sometimes brought from China made of what is called white copper, which sells in China, when manufactured into utensils, for about one-fourth of its weight in silver. It has been analyzed by Dr. Fyffe, who found it to be a mixture or alloy of copper, zinc, and the rare metal nickel, in the following proportions :

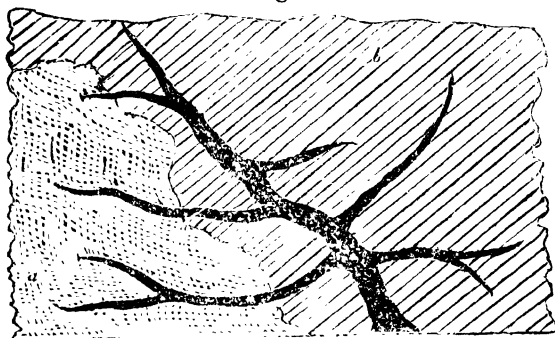
Copper,.....	40.4
Zinc,.....	25.4
Nickel.....	31.6
Iron,.....	2.6
	<hr/>
	100

Geological situation of Copper.—The great deposits of this metal occur in the older rocks, both in the sedimentary strata and in the unstratified rocks, which are generally considered to be of igneous origin, that is, granites, porphyries, and traps ; and it has been met with in minute quantity in the lava of existing volcanoes. Cornwall, which is the greatest copper country in the world, is composed entirely of rocks of the primary or oldest transition classes, chiefly slate associated with granite and porphyry. The slate is called *killas* in the country ; the granite, *growan* ; and the name *elvan*, although more particularly given to porphyry, is applied also to any other rock which is found in the *killas* or granite ; so that a fine-grained granite is often called *elvan*, if it traverse the ordinary granite of the country.

The copper ore is found in veins composed of a mixture of the ore with quartz or fluor spar, or both, which occur for the most part in the *killas*, generally a greenish argillaceous slate, and veins which have been worked in the *killas* have been often followed into the granite, without any change in their magnitude, richness, or general composition, although for the most part a change takes place in the quality of the vein when it passes from one rock into another. Mineral *veins*, although called by that name from the resemblance of their ramified forms to the veins of the human body, do not

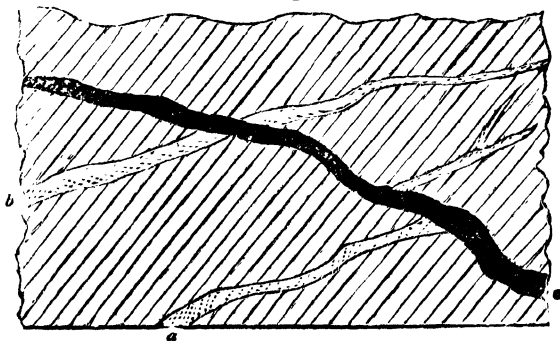
occur like these in any distinct systematic arrangement, but with the irregularity and arbitrary dispersion of chance cracks in a hard body when fractured, the cracks being afterwards filled up by a new substance injected into them. If we suppose a vertical section to be made of a country composed partly of granite, and intersected by mineral veins, it would present an appearance similar to the following figure :

Fig. 1.



where *a* is the unstratified granite, and *b*, the strata of slate, in which the continuity is broken by veins filled up with various minerals, different from either the slate or the granite. It is evident that the substance of the veins is of posterior formation to the rocks in which it is contained. It frequently happens, that one series of veins intersects another series, as in the following figure :

Fig. 2.



where the vein *c* has evidently been formed after *a* and *b*, because it intersects them, and the disturbing force which produced the rent that was afterwards filled by the matter of the vein *c*, was such as to throw the vein *a* off its continuous course, for the lower portion is at an inferior level to that portion which is above the vein *c*. Evidence of the same disturbance is indicated by the changes in the stratification of the slate, which are not attempted to be shown in the diagram, as it would be difficult to represent such complicated disturbances as usually appear on such occasions.

The courses of mineral veins are extremely irregular, and their phenomena are complicated in the extreme. Hence the hazardous and deceptive nature of mining adventures. The theory of the formation of mineral veins, whether as to the causes which produced the rents, or to the manner in which these rents were afterwards filled up, is involved in the greatest difficulty. That the greater part of them were filled by the injection of melted matter from the interior of the earth, is now the prevailing opinion of geologists; but there are many appearances in veins which cannot be accounted for on that hypothesis.

Copper ore is also found in the carboniferous or mountain limestone, as in Staffordshire, but very sparingly, considering the great extent of that formation. In England, none of the superior strata contain more than occasional traces of copper ores; but in Germany there are beds of what is there termed *kupferschiefer*, or copper slate, which occupy the same position in the order of stratification as the red marl, *K*, of the series of sedimentary deposits in England, and from that slate a considerable quantity of copper is obtained.

MINES.

The country of Cornwall alone produces more of this metal than all the other copper-mines of Europe put together ; and in no part of the world are there any so productive. These vast riches became known, however, at a comparatively recent date, and copper mines were wrought in Germany and Sweden several centuries before those of Cornwall were opened. The records of copper-mining in Great Britain are scanty and imperfect prior to the seventeenth century. The Romans had brass-founderies in different parts of Britain, but it does not appear from what places they got the copper ; the probability is, that it came from the Island of Anglesea, as in a part of that country, to be mentioned hereafter, ore of this kind lay very near the surface. There are no remains whatever of the operations of the Romans in any of the copper-mines of Cornwall. It is stated by Carew, that in the year 1586, the ore of a Cornish mine was shipped to Wales, to be refined there ; but the copper ore of Cornwall, prior to the year 1700, was principally, if not wholly, derived from the tin mines, or at least from mines which were originally wrought for tin. Copper was largely imported in the early part of the eighteenth century, and it was not until about the year 1720, that this country supplied itself with this metal from its own mines. The copper money of Great Britain was not coined from British copper until the year 1717. It was not till the latter end of the seventeenth century, that mines were first set at work in Cornwall purposely for copper. At the revolution of 1688, the crown gave up all claims to the ores of what were termed the *ignoble* metals, and in consequence of the brighter prospect of realizing profits, large capitals became invested in mining speculations in Cornwall soon after that period. They have been carried on with great enterprise and increasing skill from that time, especially in later years, during which, vast improvements have taken place in the whole art, but especially in the machinery employed for raising the ore, and carrying off the water from the great depths. M. Elie de Beaumont, a dis-

tinguished civil engineer of France, who visited Cornwall a few years ago, speaks in high terms of the skill with which the mining operations are conducted, and that he found the most recent discoveries, both in science and art, applied in practice with great judgment.

The greatest proportion of the mines of Cornwall lie between the town of Truro and the Land's End. They are not widely scattered, but are accumulated in groups on a small number of points. The most important are in the neighbourhood of Redruth. We have said, in the last section, that the ore is contained in veins, which traverse the slate rocks, or killas, and the granite. There are three systems of these veins, or lodes, as they are called in the country: the oldest and most numerous run in a direction from east to west; the next series run from south-east to north-west; and the third series, which are only known to be of a more modern formation, because they cut through the others, have also an east and west direction. These veins are not vertical, but for the most part, incline at a considerable angle. The east and west veins usually dip to the north at an angle of about 70° ; but sometimes at so low an angle as 35° . Scarcely an instance has occurred of a vein having been found to terminate downwards, or, as the miner's phrase is, being cut out in depth. When the working of a mine is given up, it is in general either on account of its poverty, or of the expense of sinking to a greater depth being greater than the produce would justify. The average width of these metalliferous veins is not more than three feet, and they are considered to be large if they are six feet wide. Instances, however, occur of veins of nine and twelve feet; and in one mine, called Relistian Mine, there were parts of the vein which were thirty feet wide. The veins of more modern formation are, in general, wider than the oldest east and west veins. Their length is very various: the east and west veins have been traced for seven miles, but they do not extend in general farther than from one to two miles. Many remarkable phenomena occur at the intersection of the different series of veins, such as the older vein becoming richer on each side of the intersecting

vein, and sometimes becoming richer on one side and barren on the other. These veins are not all copper lodes, for tin is also one of the great products of the Cornish mines.

There are at present eighty-four different copper mines worked in Cornwall. The produce of these is very various, some being so poor as not to yield more than about half a ton of pure copper annually, while others yield above 1,900 tons. Some of these mines are worked to a vast depth; that called Dolcoath has workings at 1,368 feet below the surface. The Consolidated Mines are by far the most extensive of any in Cornwall, or indeed in any of Europe*. They are situated in the parish of Gwennap, about three miles east of Redruth, along the brow of a range of steep hills, and occupy an area of about 800 acres. The site is about 800 feet above the level of the sea, and the bottom of the deepest shaft is 1,340 feet below the level of the sea, and 1,652 feet from the surface, being the deepest excavation in Great Britain. The principal lodes are from two to eight feet wide, with branches from them, varying from twelve to eighteen inches in width. There are vertical shafts, or pits sunk upon the different lodes, which in the aggregate exceed twenty miles of perpendicular excavation over the whole area; and the aggregate extent of the levels, or ways, driven in all directions from these shafts, is about forty-seven miles. "The enormous power of machinery employed on this concern, for drainage and other purposes, greatly exceeds any similar combination in the whole world, and forms an unparalleled example of mechanical skill and ingenuity, as applied to mining on its most extensive scale. This machinery consists of eight very large steam-engines, employed in pumping; their dimensions varying from ninety to sixty-five-inch cylinders;—a smaller engine, of thirty-inch cylinder, used for the same purpose;—eight steam-engines, of about twenty-inch cylinder, employed in drawing ore and vein stuff;—being altogether seventeen steam-engines,

* For this information, respecting these remarkable mines, we are indebted to Mr. Frederick Burr, a gentleman in the office of the chief engineer of the mines, John Taylor, Esq., through whose medium we have obtained it.

of which four are the largest ever erected. There is also a water-wheel, forty-two feet in diameter, employed in pumping; another, thirty feet in diameter, for driving machinery; and four smaller ones, for stamping and other purposes; altogether six in number. Several horse whims are also employed. Calculating the force constantly exerted by this stupendous accumulation of mechanical power, when working at a moderate rate, it may be stated as equivalent to the work of from 900 to 1,000 horses; which, however, is by no means the extent of its power. Supposing that it were possible to employ animal power, three relays of horses would be required in the twenty-four hours, besides an extra stock for casualties, making the actual number of horses to which the engine-power at the Consolidated Mines is equivalent at least that of 3000 horses. It should, however, be taken into account, that horses' power, so termed by engineers, considerably exceeds the strength of an ordinary horse (according to some authorities, by one-third); and bearing this in mind, it will not perhaps be too much to say, that the engine-power employed in these mines is nearly, if not quite, equal to the work of 4,000 horses; and were it exerted to its full extent, to that of from 7,000 to 8,000 horses. The amount of human labour is proportioned to the power of the machinery: the number of persons usually employed being about 2,400, independent of the numerous class who derive support in an indirect manner from these mines." The ore is chiefly that variety called "yellow copper-ore;" and the average quantity of fine copper annually produced was, up to 1831, about 1,300 tons, or about one-ninth of the total quantity of this metal annually furnished by Great Britain. Since then, the quantity has considerably increased, having amounted, in 1832, to 1,530 tons, and in the year ending June last, to 1,914 tons. The gross returns for last year were 152,000*l.*, the charges 105,000*l.*, leaving a profit of 47,000*l.*

Several of the Cornish mines are worked under the sea; as in the parish of St. Just, where the entrance to them is almost on the very edge of the precipitous termination of the land, and workings extend from the vertical shaft far under

the bed of the ocean. It is long since the Cornish miner showed his daring intrepidity in undertaking works of this nature, for Botallock mine has been wrought under the sea from a very remote period ; and Pryce, in his ‘ *Mineralogia Cornubiensis*,’ gives the following interesting account of another mine :—“ The mine of Huel Cock, in the parish of St. Just, is wrought eighty fathoms (480 feet) in length under the sea below low-water mark ; and the sea in some places is about three fathoms over the back of the workings, inso-much, that the tanners underneath hear the break, flux, and reflux of every wave, which upon the beach overhead may be said to have had the run of the Atlantic Ocean for many hundred leagues, and consequently are amazingly powerful and boisterous. They also hear the rumbling noise of every nodule and fragment of rock, which are continually rolling upon the submarine stratum, which altogether make a kind of thundering roar, that would surprise and fearfully engage the attention of the curious stranger. Add to this, that several parts of the lode which were richer than others have been very indiscreetly hulked and worked within four feet of the sea ; whereby, in violent stormy weather, the noise overhead has been so tremendous, that the workmen have many times deserted their labour, under the greatest fear lest the sea might break in upon them.”

The introduction of a rich copper ore into England, from her own colony, in quantity, and of ready and easy reduction, would doubtless have injured beyond calculation the copper mining interests of Cornwall and Wales; and it is not surprising that the results shewn by the "*Welch Company*" are so different to what they should have been, when we reflect how much depends on the mode of reduction adopted, and the care bestowed on the process, an excess of heat or protracted exposure, destroying the metal. It is only a matter of wonder that the ore was *allowed* by them to yield so much as 23 *per cent*.

The question will naturally be asked, why Captain Ashton relinquished so fair a field? It appears that Ashton was but slightly acquainted with his subject; was not possessed of the means of proceeding with an undertaking which to carry on successfully has always required vast capital. Ashton, by his reports to Government, appears, during the five years' lease he obtained, to have got out but a single miner from England; to have become embarrassed in his circumstances, and to have been compelled from want of funds pursuing the adventure. His friends, now in the service, assert, that on quitting the country, he is said to have remarked, "*that he had left at the Nellore copper mines, an inexhaustible source of wealth for some more fortunate man.*"

Mr. Hayne's reports carry on the face of them due weight—he was the Company's Naturalist on the Madras Establishment. Captain Bishop's opinions are also valuable: his death almost immediately after making his proposals to Government, (to which they acceded,) set the subject at rest, until I called the attention of the public to it. Captain Bishop was an Officer of the Madras Army, and Superintendent of the Powder Mills at Madras; he was considered a very scientific man.

In November, 1832, I first entered upon my inquiries, regarding these mines, and in conjunction with certain parties in Bengal and England, determined on relinquishing the Company's service, and embarking in the undertaking—the failures in Calcutta in the early part of 1833, and the conse-

quent losses in England, deranged my plans ;—in the meantime, I spared no exertion or expense in getting the districts surveyed ; and, at a very heavy outlay, have been enabled to make a selection of country abounding in copper ore : these tracts have been granted in lease to the present “ *Company*,” designated “ *De Fondclair & Co.*” which has been established through the joint efforts of myself and Mr. De Fondclair. Cowles or leases of the exclusive right of mining for copper ores in the lands of the Rajahs of Calastry and Vencatagherry have been obtained for the Company ; as also from the Nabob of Udagherry* : to the west of the mining districts, abundance of wood and charcoal for smelting is to be had, and about 40 miles distant, in the Nullah Mullay range of mountains, timber of immense growth abounds—the expense of carriage to the works (which, on the Woodliwar, or country bandy, is a trifle,) being its only cost. Granite and carbonate of lime are at hand in abundance, and the distance from the present mines to the coast is but 40 miles of level country.

Any person at all conversant with mining operations will at once perceive the extraordinary waste of human labour, by which Captain Bishop proposed to work these mines ; *as* a commencement it *might* do very well, until the value of the undertaking was established ; but the saving that must accrue by substituting “ *steam*” and other machinery, in lieu of men to lift up the enormous quantities of ore and water daily raised—as also from the adoption of the system pursued in Cornwall, where the most beautiful and harmonious means are rigorously followed, to save manual labour, and to employ it to the greatest advantage, is evident.

After the sinking of the shafts, and so soon as the ore in quantity is arrived at, the estimated expenses attending the raising and conversion of ore into metal, will, according to my calculation, be as follows :

* These Leases have all been confirmed by the Government of Madras.

<i>Dr.</i>	<i>Cr.</i>
To breaking and raising 100 tons of ore, at 15 Rupees per ton, 1,500	By 40 tons of copper, in pigs, the produce of 100 tons of dressed ores, at the estimated average produce of 40 per cent. metal in the ore, taking the copper to be of the value of Rs. 1,000 per ton, is Rs. ....40,000,
To spalling, (i. e. reducing the large rocks of ore into small pieces, fit for the stamping mills,) 8 Ans. per ton, 50	
To stamping 104 tons of ore fit for smelting at 12 Ans. a ton, 75	
To dressing 100 tons of ore, including the calculation for carriage of the ore from one place to another, at 3 Rupees a ton, 300	
To smelting 100 tons of dressed ore, at 50 Rupees a ton, 5,000	
<hr/> Rupees 6,925	
To balance of profit on sale of 40 tons of copper, in pigs, the produce of 100 tons of dressed and picked ores, ... 33,075	
<hr/> Madras Rupees, 40,000 Mad. Rs. 40,000	

The above shows a profit of Rupees 33,075 upon 100 tons of picked and dressed ores ; and by this calculation, the value of raw ore, picked and ready for conversion, would be about 350 Rupees a ton.

So soon as workmen and smelters can be procured from England, it will be the interest of the association to reduce their ores in this country ; until then, the crude ore might as dead weight, be sent home, and become an immediate source of great profit.

The liberality of Government, as manifested "*by the minute of Council*," gives the Company an exemption from all duty for the first 10 years of their lease ; and the magnitude of the undertaking can only be limited by the outlay applied, as all the lands supposed to contain these ores, *and these to a very great extent*, have been secured to the Company.

These mines, as Dr. Thomson justly remarks, were worked some centuries ago, and in the survey I lately made, I discovered excavations *of the most astonishing description*, where copper ores had been obtained by the native powers under former Governments ; and when we consider the ages that have passed since the use of brass utensils first obtained, and have been considered a necessary part of every Brahmin's domestic establishment ; and when we observe the annual demand in Bengal for copper to the amount of crores of rupees, we are naturally led to the question, *how*, and from whence was the supply of this useful metal obtained, before India became known to us. Copper ores, we know, are not confined to this part of India ; for in many parts of India, they manifest themselves, although no where in such richness, and so near the surface, as in the grants of the present Company. In Bengal, copper mines are worked by the natives at the present day ; some idea prevailed, that the Nellore copper ores were found alone in "*nests*," not "*veins*:" I have however "*proved*" the contrary. A peculiarity certainly attaches to the ore called by Dr. Thomson "*the anhydrous carbonate of copper*," in its invariable position in "*nests*," as far as my experience has hitherto gone ; but malachite I have always found in "*veins* ;" as also a steel-grained, crystallized silvery ore, which I have invariably found in greenstone slate, and partly embedded in quartz ; this last ore is the richest I have met with, and a parcel has been sent home for report.

"In the Valenciana mine in Mexico, 3,100 men were daily employed, whose labours sent up between 300 and 400 tons of raw ore—1,200 of these men were employed in boring and blasting about 600 holes in the twenty-four hours, each hole of four feet eleven inches deep. Baron

Humboldt, one of the best authorities of the day, says, in relation to the Mexican mines : The mines of *Rayas* continue to furnish extremely rich ores, while at ‘*Valenciana*,’ they have endeavoured for some years to supply, by the extraction of a greater quantity, the deficiency in their intrinsic value.

“ All the valuable mines, namely, ‘*Valenciana*,’ ‘*Tapeac*,’ ‘*Cota*,’ ‘*San Lorenzo*,’ ‘*Sirena*,’ ‘*Mellado*,’ ‘*Fraustros*,’ ‘*Rayas*,’ and ‘*St. Anita*,’ being included in a distance of 8,529 feet, there is every reason to believe, that in each of those mines similarly rich ores may be found, as in the *Valenciana* and *Rayas* mines ; *but at different distances from the surface*. In this celebrated mine, (the ‘*Vata Madre*,’) there is a certain middle region, which may be considered as a depository of great riches ; for above and below this region, the ores have yielded an inconsiderable share of metal. At “*Valenciana*,’ the rich ores have been in the greatest abundance between 328 and 1,115 feet below the surface ; *while the abundance appeared at ‘Rayas’ at the surface.*”

These remarks of Humboldt show, that it is no unusual thing to find the fairest promise on the surface, as in the case of the “*Rayas*” mine, and also in the “*Nellore mines*.”

The formations in the mining districts are all primitive, and the richest ores have been found within a few feet of the surface, and not confined to one spot, but over a vast range of country—under such circumstances, it would be matter of surprise indeed, that on search, and on following these veins, large depositories of ore were not discovered, indeed, a report (of Mr. Travers’ the Collector) to Government, which I have seen, states ; that blocks of the ore had been used at Guramenypentah to mend the village tank, which were subsequently removed by *Ashton*.

I have given this subject my most full attention. I have visited all the localities, have mined, and followed the veins—examined thoroughly the different districts, and their formations, and my firm opinion is, that any quantity of the richest ore may be obtained, at a trifling expense, and within 100 feet of the surface—charcoal, lime, timber, stone,

and clays are all abundant, and available for the use of the Association, almost immediately on the spot, and nothing I consider can prevent the entire success of this mining undertaking. As Government have allowed covenanted servants to hold an interest in the “Iron and Steel Company,” it is supposed, no objection can exist to their holding in a like manner, shares in this Association :—If the idea obtains, that receiving dividends from a “Mining Body” savours of trade, equally so did dividends payable on the India Company’s Stock ; it is simply the investment of money (in this case) with a public body, the direction of which guards its interests, and the individual share-holders may therefore be in no wise concerned in its management :—I hope the Government will be too liberal to regard it in this light.

C. A. KERR.

M E M O.
WITH AN ANALYSIS
OF
THE ORES OF COPPER,
IN THE
NELLORE AND CUDDAPAH DISTRICTS,
AND IN THE
Z E M I N D A R I E S
OF
VENCATAGHERRY AND CALASTRY;

ALSO
REPORTS ON THE SUBJECT TO THE
MADRAS GOVERNMENT,
By Mr. B. HAYNE,
THE HONORABLE COMPANY'S NATURALIST,
ON THE MADRAS ESTABLISHMENT :

AND
By CAPTAIN BISHOP,
OF THE MADRAS ARMY.

TOGETHER WITH A FEW REMARKS,
Nests, in primitive Rocks, which seem to
be or at least connected with primitive
Rocks appear to be subordinate to them.

MADRAS :
PRINTED AT THE ATHENÆUM PRESS,
J. B. PHAROAH, PROPRIETOR,
Mount-Road, —1835.

THE *Analysis of the Ore* by Dr. Thompson, M. D., F. R. S. and E. The Copper mines in the Nellore and Cuddapah Districts, were discovered about 40 years ago, by Mr. “ Benjamin Hayne ” who reported on them to Government in the fullest and most satisfactory manner—and this Gentleman in his “ *Hayne’s Tracts on India* ” gives a most favorable account of them.

From Mr. Hayne’s Notice of the subject, a Captain R. Ashton of H. M. 12th Foot, interested himself about these mines, and collected a large quantity of the Ore from within 35 feet of the surface,—which he sent to England: the result on the smelting of one batch sent home by Captain Ashton (by the “ Welch Copper Company ” who could not have been expected to view the subject very favorably) is submitted. The Welch Company made the out turn of metal only 23 per cent,—this, although three hundred per cent better than the Cornwall Ores, *is not above half the average* yield of the Nellore Ores.

A Paper read before the Royal Society, November 18th 1833, by Thomas Thompson, M. D., F. R. S. and E. viz. *Analysis of a New species of Copper Ore.*

“ From Hayne’s ” description it is probable, that it occurs in Nests, in primitive Rocks, which seem to be green stone or at least connected with primitive trap. These rocks appear to be subordinate to mica slate. Copper mines had been wrought in these mountains some centuries ago ; but they had been abandoned probably on account of the various revolutions to which this part of India has been subjected.

The most common Ore which occurs in these mountains is malachite, and it seems to occupy very exten-

sive veins; but the species which I propose to describe here occurs also in considerable quantity. It had been already made the subject of various experiments, with a view to determine how much Copper it contained, but I am not aware that any person had subjected it to a regular chemical Analysis, or recognised it as a new species.

All the specimens of this Ore which I have seen are Amorphous; so that as far as is known at present, it never occurs crystallized. Quartz crystals indeed are imbedded in it abundantly and very irregularly—sometimes they are single, sometimes they constitute the lining of small cavities to be found in it. These crystals are translucent. In some rare cases they are colourless; but by far the greater number of them are tinged of a yellowish red; and some of them are green. The mineral is likewise interspersed with small specks of Malachite, and with dark brownish red, soft particles which I found to consist of red oxide of Iron.

The colour varies in consequence of the irregular distribution of these extraneous substances. One specimen which was the most free from the Malachite and the red particles, was of a dark blackish brown colour. But in general the colour is a mixture of green, red, and brown, sometimes one, and sometimes another prevailing. Small green veins of Malachite likewise traverse it in different directions.

The fracture is small, conchoidal, and in some parts of the mineral there is a tendency to a foliated fracture. The lustre is glimmering, owing, I conceive, to the minute quartz crystals scattered through it. The kind of lustre is resinous; and on that account and the variety of colours, this Ore has a good deal of the aspect of serpentine.

It is soft, being easily scratched by the knife. It is

sectile. The streak reddish brown. The specific gravity 2,620.

It effervesces in acids and dissolves, letting fall a red powder. The solution is green or blue, according to the acid, indicating that it consists chiefly of Copper.

After a few preliminary trials to ascertain the nature of the constituents of this Ore, I adopted the following mode of Analysis.

1. 100 grains in the state of a coarse powder were put into a phial containing diluted sulphuric acid, and the mouth of the phial was stopped with cotton wool. The loss of weight, when the effervescence was at an end, amounted to 16.7 grains. This loss was owing to the escape of carbonic acid gas.

2. 100 grains of the Ore were treated in the same way with muriatic acid. The green solution was decanted off, and evaporated nearly to dryness, to get rid of the excess of acid. A plate of zinc was then put into the liquid previously deluted with water. The Copper precipitated weighed 48.5 grains.

On repeating the Analysis, I found that the muriatic acid had likewise taken up a portion of Iron. I therefore supersaturated the solution with ammonia, and threw the whole upon a filter. By these means the red oxide of iron was separated. The ammonical solution was then neutralized by muriatic acid, and the Copper thrown down by a plate of zinc. But during my first Analysis, none of the iron was taken up by the cold muriatic acid, owing, no doubt, to the state of its aggregation.

3. The red powder, which remained undissolved after the muriatic solution was drawn off, was boiled for several hours in nitromuriatic acid. The matter gradually diminished in bulk and became white while the acid acquired a golden yellow colour. The acid was now separated from the undissolved powder, evaporated

nearly to dryness to get rid of the excess of acid, deluted with water, and mixed with an excess of ammonia. A brown powder fell, which was separated by the filter, and which after being dissolved in muriatic acid was precipitated dark blue by prussiate of potash. The remainder being mixed with tallow and suddenly heated in a covered crucible, became black, and was attracted by the magnet. These properties leave no doubt that the powder was peroxide of iron.

4. The ammonical solution had a light blue colour, I therefore neutralized it by muriatic acid, and put it into a polished plate of zinc. I obtained a sensible deposit of copper; but so small, that I was unable to collect and weigh it. I estimate it at about 0.1 grain.

5. The white undissolved matter being heated to redness weighed 2.1 grains. On examining this matter attentively, I found it entirely composed of fragments of quartz crystals which had been interspersed through the Ore, and had from their minuteness escaped my observation.

6. From the facility with which the Copper dissolved in muriatic and sulphuric acids, there could be no doubt that it existed in the Ore in the state of an oxide. But the red colour of the Ore made me uncertain whether the oxide was the red, or the black. I therefore put 100 grains of the ore into a tall narrow phial, filled the phial full of water, and then by means of a funnel poured a quantity of muriatic acid into the bottom of the vessel. The ore was immediately attacked, and the solution from the very commencement appeared green. This I consider as a demonstration that the copper in the ore was in the state of black oxide. Now, black oxide of copper is a compound of 100 metal + 25 oxygen. To that the 48.6 grains of copper, extracted from the Ore

when in the state of black oxide, must have weighed 60.75 grains.

From the preceding Analysis, it appears that the Ore is composed as follows :—

Carbonic Acid.....	16.70
Peroxide of Copper.....	60.75
Peroxide of Iron.....	19.50
Silica.....	2.10
Loss.....	0.95
	<hr/>
	100.00

The Silica was obviously accidental and derived from the quartz crystals; so that the ore, in fact, consists of carbonic acid, peroxide of copper, and red oxide of iron. In the different analysis, I have found the copper to vary a little. The least quantity I obtained was 48.6, the greatest 51 grains—These variations are owing chiefly to the admixture of quartz crystals, and partly to the specks of malachite and red oxide of iron with which the ore is interspersed.

The carbonic acid is obviously combined with the black oxide of copper, so as to constitute “carbonate of copper.” Now carbonate of copper, as I ascertained by a direct analysis, is composed of an integrant particle of carbonic acid, and an integrant particle of black oxide of copper. An integrant particle of carbonic acid, as I have shewn elsewhere, weighs 2.751 and an integrant particle of peroxide of copper weighs 10.

Now 2.751 is to 10, as 16.7 is to 60.75, so that there can be no doubt that the carbonic acid and oxide of copper are united in the ore. As to the oxide of iron I am disposed to consider it as only mechanically mixed; because in one experiment I dissolved almost all the copper without touching the iron. Yet it deserves attention, that 77.4 and 19.5, the weight of carbonate of

copper and oxide of iron found by the preceding analysis, correspond with three integrant particles of carbonate of copper, and one integrant particle of peroxide of iron.

We were previously acquainted with two other native species of the salt, namely, malachite, and blue carbonate or copper azure. But both of these are "*hydrous*" carbonates containing water as a constituent, and if any confidence is put in the analysis of "*Klaproth*," whose precision is sufficiently known, malachite contains twice as much water as the blue carbonate. Blue carbonate is a compound of one integrant particle of water, and one integrant particle of carbonate of copper, white malachite contains two particles of water. Our ore is an "AN-hydrous carbonate of copper." When heated to redness, it loses its carbonic acid, but undergoes no further change. Some specimens lost about half a grain more than their carbonic acid. This I ascribed to the water in the malachite, with which the ore was occasionally mixed.

REPORT ON THE NELLORE COPPER MINES BY
BENJAMIN HAYNE, M. D.

Company's Naturalist, Fort St. George.

The districts on the coast in which Copper Ores have been discovered are those of the Calastry and Vencatagherry Zamindaries and the Udygherry Jaghire in the zillah of Nellore, and Duppaud and other places in the Ceded districts.

I intended on my late excursion to give a full account of them all, but was prevented by the heavy rains and obliged to confine myself chiefly to those in the Calastry zemindary, which by Captain Ashton's attempts of working them, have excited the most interest, and have become even lately the subject of speculation and of discussion at the Presidency.

As the Udygherry district lies very near to the latter, I have taken an opportunity of seeing them also, and will mention them occasionally when any circumstance should occur of comparing and contrasting them with those under particular consideration.

The district of Calastry in which the mines are situated is the most northern of that Zemindary, to the west of it lies the Udygherry Jaghire, and the Ceded districts; to the north, the Naidoo country, a district belonging to the Vencatagherry Rajah, and to the eastward the Nellore district. The villages indeed of the different countries lie here in a strange manner, intermixed, owing to former feuds and irregular settlements between the petty chiefs of the country.

The principal mining places are at the distance of about 50 miles N. W. from Nellore 30 miles from the sea, about the latitude of Ramapatam a place well known to all travellers up and down the coast, and about 40 miles N. E. from Cuddapah.

Several rivers run right through it on their way to the sea from the western hills, of which the Pillapey-roo Vuppovageo, and Manyroo form a junction not far from Gurramenapentah, the principal mining place, and form a pretty large river, which is said to have a good deal of water throughout the year. Its beds are very stony which seems in the eyes of the Natives the greatest objection against its being made navigable for boats, it deserves therefore an accurate survey.

The general aspect of the country is barren, and uncomfortable in the extreme, large trees are only found in and near the villages, and on the wide, extended plains on both sides of the river, nothing encounters the eye, but here and there a small thorny shrub. The grass which in the rainy seasons every where else carpets the country with a refreshing green, is here both scanty and of the poorest kind. A species of "aristida" which as the name implies, is a compound of long beards or bristles. This is the case in most mining countries, the surface of the soil contains in many places so much salt, that the inhabitants could make enough, if allowed to do so, for their own consumption.

In summer this part of the country is extremely hot. The villages are small, and the houses mean, they consist generally of three or four small detached huts one serving as a sleeping room for the family, the other for a working room and the third for stores. The cattle are kept in the open air, except in the rains when they form part of the family in the houses :

The inhabitants appear healthy, and numerous.

The cultivation is chiefly confined to Paddy for which there are large tanks near the villages :

On the high grounds they sow some dry grains and in the proper season horse gram, the former looks even in this fine season, miserably poor.

To the eastward the country is open, only here and there a few low hills are to be seen, but to the westward, there are ranges of hills, the nearest at the distance of about 10 miles. Due west is one called Malla-coudah from being the highest hill in the range. It is said to abound with wood. The Udygherry mountains are to the south west, about 16 miles, and the highest in this part of the country: the highest point I take to be about 3,000 feet above the level of the low country: I have seen myself that plenty and large wood grows there, particularly between the valleys.

About 20 miles on the way to the sea in *the direction of Ramapatam are extensive jungles.*

1. Korra Pamcumitalicum L: and Aruga Pospalum trumeulacium L:

Woolava, Glycone tomentosa L.

This country is geologically speaking of a primitive description, the general rock formation, is a mica state of different colors and consistence. It shews itself first in the low country, at the distance of about 15 miles east from the hills, it forms sloping mountains which are often capped with horn-stone slate, which passes into sand-stone, and on the other hand into jasper. The tabular summits and mural precipices of the Udygherry hills consist of the latter stone kind: the layers or strata of the mica slate occur in different positions and inclination to the horizon, often in the low country forming a right angle with it, on and about the Udygherry hills the strata appears in the utmost confusion as if thrust by force out of their proper position traces of copper ores are often found in this rock and it is generally known to contain various metallic veins "*as gold, silver and copper.*"

Subordinate to the former is green-stone slate, in mighty layers often as to appearance constituting the princi

pal rock of a district for many miles. This is the case about Guramanapenta and the other mining places. The layers or stratification of the latter rock I have as yet always found in horizontal position.

The green-stone slate is often approaching to green stone, it occurs then only obscurely slaty, has a jet black color, strong glossy lustre, foliated fracture, hard in a small degree, in this state it seems here barren of metals of any kind. The real green-stone slate is of a bluish black color with small white spots of decomposed Feltspar, half hard, and when exposed to the air it crumbles soon to pieces and takes a green color. The rock is reckoned one of the "*richest mother of ores*" of any in the world. In it are found "*silver*" and "*copper*" in rich beds or layers as is the case here, but never in veins, as in other formations.

The layers of copper are of different thickness and distances from each other, the general run of the pieces of ore, constituting the layers is two inches in thickness, but they have been found also of several feet. The pieces are in general flat as if compressed, and coated with ochre. The vertical distance between the layers, is 4 to 8 feet, and the horizontal is even more uncertain.

A corroded honey combed quartz is found in great abundance in the green-stone slate particularly, along with copper ore. It appears often on the surface, in such places where the water has washed the earth away. It looks then like indurated marl, which in other parts of the country is very common.

This rock is covered with a red coarse gravel, which is the superficial soil of this part of the country. In my opinion this is formed from the decomposition of the green-stone slate, and its quartz ore and ferruginous contents, for copper ore is often formed in it in consider-

able quantity and in the same situation as in the slate rock.

At Yerrapillay in a new mine which I opened I found two layers of ore in it at distances of 4 feet asunder.

The thickness of this stratum of gravel differs according to its situation whether it is on a high or low ground, I have found it from 4 to 6 feet and more.

Copper ore which Dr. Thomson calls Anhydrous. The most common kind, is in flat pieces externally of a brown ochry color, internally of a black iron color, which often passes into green, when moistened with water it becomes almost immediately throughout green; in some pieces it is bluish grey throughout. Lustre in some places, where it is black, semi-metallic, and in the bluish, grey metallic; the copper indeed is in an almost metallic state in it; fracture approaching to even, fine grained, streak of the black brighter metallic powder "*greenish*;" not very hard, except the iron black and bluish grey part which is with difficulty scratched by quartz, brittle, not particularly heavy, specific gravity 309; some pieces are found of a nut brown color and some with conchoidal fracture. The foreign admixtures are various, as white and green quartz, mica, iron ore; mountain blue, and malachite, are in some places found with it. In other places I suspect the admixture of silver, for the analysis, I must refer to that of Dr. Thomson, in a paper laid before the Royal Society of London, which I was permitted to publish as an appendix to my "*Tracts on India*." I will only mention here that on an average he received 50 per cent of pure copper. In the dry way or by simply smelting the ore we have received the metal in *greater proportion*, which may be easily accounted for by the quantity of iron which the ore contains, that cannot be separated as when the analysis is carried on by acids and other reagents.

A quantity which had been sent home some years ago by Captain Ashton to England, was assayed by order of the Court of Directors in the common way, by the people trading in copper, and according to the report which I have seen, the result was different from any made in this country and from that of Dr. Thomson's. The best parcel, I believe there were 6 or 8 made of different qualities, yielded only 17 and the lowest 6 per cent. By my enquiries on the spot from whence it was sent, and from people who then were employed in the business, I understand that Captain Ashton himself was not present when the ore was dispatched, and that a servant of his "*sent all the rubbish he could collect about the mines.*" This, however, will not quite account for the low valuation of the best kind, of which it may be presumed there must have been a quantity among the whole.

The discovery of these mines by the Natives seems to be an event of latter times, and to judge from the appearance of the old mines, and the account of the Natives themselves, the period cannot be reckoned further back than 50 or 60 years ; they are ignorant as present of the person who first made the clumsy attempt. In the Calastry country. I have found but one place at Yerrapillay which was pointed out to me about 12 years ago, when it appeared as if it had been worked but a few years before ; the first undertakers seem to have confined themselves chiefly to the mines which they discovered on the hills, as appears at Wangapaudoo in the Ven-catagherry, and Sacalacondah in the Nellore district : as to my discovery of them in 1801. I beg leave to refer to my reports on the subject to Government.

A year after, Mr. Traver's who had become attentive to the subject by my researches in his and the neighbouring districts reported the discovery of copper mines in the Calastry country to the Board of Revenue, which is the reason of their ascribing the first notice of them

as having originated with that Gentleman, in their letter to Government, dated 20th July 1815.

Captain Ashton introduced by Mr. Travers, made his offer of working them to the Calastry zemindar and to Government and obtained a lease for 5 years.

The principal mines which have been opened by Captain Ashton lie within a small distance from each other on the banks of the rivers Pettapeyroo and Vuppoovagoo, the most promising are close to a village called Gurramanapentah, where at the depth of from 4 to 15 feet, a great quantity of the richest ore has been found. The ground is rather low and a large tank close by it on which account the water rushed in and impeded the work. This ground, however, I take to be 60 feet at least above the level of the river, which is at the distance of about half a mile west from it : The high ground east of it is equally rich, and about a quarter mile south he had another mine on ground belonging to a village, called Sallagulgulah.

At Boungaralapadoo or rather on grounds belonging to a village of that name, situated between the rivers of Pettapeyroo and Vuppoovagoo : Captain Ashton has made various attempts. At one place he went to the depth of about 50 feet, and found great store of fine ore. This mine is about 100 yards from the bed of the river, and the bottom of the mine I take to be on a level with it ; he discontinued the work on account of an accident that happened to some people working in it, at many other places in the vicinity of this trifling attempts have been made, and so far successfully, as to get a good deal of ore with the least possible expense.

As my views were to ascertain the nature of the rock, and its contents, and the way in which the ores were found in it. I opened a mine, on a high ground of the village of Yerrapillay, which lies about 5 miles north from Guramanapenta, and on a continuation of the

same plain, some loose pieces of ore that had been found in a Nullah determined me as to the spot. The heavy rains which soon after set in, prevented me from going deeper than 16 feet, but with the assistance of about 10 people a day, for three days, I discovered three different layers of ore, and got about one candy 500/lbs. of very good ore, great part of which I brought with me to Madras, the observations I made are contained in the antecedent part of this Essay.

From what I have said, it will appear that I think the mines in the Calastry country well worth the serious consideration of Government, but in order to bring the reasons which are dispersed in different parts of this Essay, under one view, I will recapitulate them in as narrow a compass as possible.

The mines in Calastry recommend themselves for consideration.

1st. On account of the advantageous situation, 30 miles from the sea, and within 20 miles of abundance of fuel.

2d. On account of a river which might be made navigable and the banks of which are from 70 or 80 feet under the level of the adjacent country.

3d. On account of the general and particular rock, formation in which the ores are found, known to be generally rich in ores, viz. Mica slate and green-stone slate and last on account of the richness of ore itself.

(Signed) BENJAMIN HAYNE,
Company's Botanist and Naturalist.

A true Copy.
(Signed) T. R. WHEATLEY,
Secretary to Govt.

True Extracts.

C. A. KERR.

MADRAS. 15th December 1815.

EXTRACTS FROM THE SECOND REPORT ON THE
COPPER MINES OF NELLORE,

By BENJAMINE HAYNE, M. D.

Company's Naturalist ; Fort St. George.

After the general account which I have given of the Calastry mines in my former report it is incumbent on me now to submit also what I conceived would be the best means to render them useful to the "Honorable Company," in order to quit myself fully on so important a subject as my limited knowledge and limited means will enable me.

For the success of speculations of this kind the greatest economy is required particularly in things which are not absolutely necessary. Buildings and costly machinery should be dispensed with and none ever erected until the latter is absolutely wanted and the former allowable by the most favorable events in the undertaking. On this principle was the Saltpetre Manufacture on the coast by me introduced, and thus should every other which I would undertake, the privations excepted, which I then voluntarily underwent, but which now my advanced years could not possibly support.

In the present instance little more is required in the beginning than to set people at work and direct them how to bring the ore in the most convenient manner to light. The nature of the rocks and the beds of ore require but little skill to do this, yet is a portion required which as we have been taught by experience on this very subject, not every body possesses nor can any general direction be given about it. The internal management must be left entirely to the person to whom the superintendence is confided.

In general I will observe that on account of the ores being in beds or layers (as coals) a large surface of ground must be laid open, which requires a greater pro-

portion of manual labour than if the metal was found in veins. On the other hand it is for the same reason easier to be worked and without any machinery. The water may be drained to the depth of 50 feet into the river which lies either close to the mines, or at no very great distance from them. If the beds should continue to a greater depth than 50 feet the water of the wells may be discharged by Pacotas into the common drain. As there is no veins it is unnecessary to provide for horizontal tunnels, and the superficiality of the ores renders perpendicular shafts useless ; but in order to lessen labour, earth-bores will be required.

Although the rock is by no means hard it will save a great deal of hard labour to provide for means of blasting it. A few Pioneers who are trained up to this work, could be usefully employed.

Labour is in most countries the principal object of expense. In England labour is supplied often by machinery, which, however, at first is very expensive. In this Country we are fortunately relieved from any strict investigation of this kind by the cheapness of labour in general ; and Government have it in their power to find a great number of labourers with the least additional expense to their present Establishment. I mean the convicts in the zillah prisons, who have hitherto been mostly employed in an unprofitable work. Five hundred or a thousand of them would in a few months establish the value of the mines, I need not expatiate on the fitness of this kind of work for convicts, as it is one which in general is assigned to them in all countries, should there, however, be an objection of which I am not aware a sufficient number of people may be found accustomed to that kind of work. The tank diggers of the country who work about 10 hours in the day for $1\frac{1}{2}$ fanam a man, and 1 fanam a woman (equal to 3d and 2d English money) and think

themselves liberally paid. They work in general by contract according to measurement and for reasons which I need point out, it is for both parties the fairest way. But Captain Ashton little acquainted with the customs of the Country settled the payment by the day, and it will be found difficult in the beginning to persuade them to revert to the old way by contract.

Among the great number of European soldiers in His Majesty's and the Honorable Company's army in India, I do not doubt many miners will be found, one or two of whom would be of great use in directing the manual labour of the mines and smelting furnaces.

The ore is of that nature as not to require any other previous operation for smelting but that of reducing the larger pieces to a smaller size, as it has neither sulphur or arsenic, or any admixture which requires separation; nor does it want any other addition but a moderate quantity of charcoal for bringing it to a state of the greatest purity. It exists nearly in a metallic state in the ore. I have seen at Guramenapenta on the place where Captain Ashton's Bungalow stood a quantity of ore which he had wasted, I do not know for what purpose, and found among it a great number of pieces which had run into pure metal.

The erection of furnaces will be neither expensive nor difficult, but as they belong to the internal management it must be left to the person who undertakes the superintendence, who in this, as well as in the working of the mines must be guided by local and other circumstances.

I have stated in my former report that fuel may be had at the distance from 12 to 20 miles; the former to the westward and the latter to the eastward of the place and within a short distance (10 miles) from the sea. It will become a matter of consideration whether the ore is to be carried to the place where the wood is found, or the

charcoal to the mines, or whether it would not be better to send the ores "*in as pure a state as they can be made as ballast to England.*" In the latter state I believe there is no law to forbid their importation. I know that ores of copper are often sent from America to be smelted in Wales, where by the bye they are thought smelt-worthy when they contain but "*4 per cent*" of good metal. But should the ore be required smelting in this Country it can be no great object of consideration if it only contains 25 per cent whatever is done. I think that it would be advisable to send the ore to the Ramapatam jungle from whence the copper may be easily sent to any other part of the country by sea. At all events the ore should be carried to where the fuel is, as 6 or 8 times the quantity of wood will be required to one of the ores. But this and many other subjects will be better argued before a Board of mines and after the acquisition of more local knowledge.

I have mentioned in my former report the Duppaud country as one in which copper is found: I would recommend this to particular attention should it be found advisable to enter into an undertaking of the kind. From the specimen I have seen, brought by Captain Arthur of the Engineers to the Presidency, the ore is of the best kind, and according to his report in abundance. The place is north of Cummum in the Ceded districts and lies in many respects more favorable than the Calastry, as the neighbouring hills have abundance of wood, and as it is in the way of the Lombardies to the coast who would barter their cotton for the copper which in the "*Nizam's*" country is an article of great value.

The salts of particular utility which are every where found in abundance are soda and saltpetre—The latter was first noticed to Government by myself, and the ma-

manufacture of it introduced on the coast. I recollect with gratitude and pleasure the encouragement I received from the Board of Revenue, and their intercession with Government for the manufacture, which experienced in other quarters much opposition.

I have given also an account of soda to Government about 10 years ago, which has been published in the transaction of the Society for promoting arts and sciences, and lately in other works. Hitherto, however, no further use has been made of it in this Country, except, perhaps in bottle making but it is certainly as much worth attention as an article of Export to Europe as saltpetre.

(Signed) BENJAMIN HAYNE,

Company's Botanist and Naturalist

True Copies.

(Signed) T. R. WHEATLEY,

Secretary to Government

MADRAS, *January 17, 1815.*

A true Copy.

C. A. KERR.

REPORT OF CAPTAIN B. BISHOP.

*To His Excellency Sir THOMAS MUNRO, K. C. B.
President, &c. in Council,
Fort St. George.*

HONORABLE SIR,

Having lately made an excursion into the Northern Circars with the sole view of examining into the nature, propable extent and promise of the copper ore in those districts, and according to the best of my judgment having found them to embrace prospects of extensive value, I have been induced to throw together in the accompanying paper such remarks as so short and imperfect a survey has enabled me to make, and beg leave to submit them to your Excellency's judgment and consideration.

Conceiving these remarks, may induce your Excellency's Government to take this matter into its mature deliberation and to cause an efficient assay to be made of these apparently decisive advantages, I am prompted to submit proposals for speedily ascertaining to what extent these ores may be worth your further attention.

Before, however, I enter into particulars it will be relavent to make a few brief observations —and first your Excellency will at once perceive the impossibility of ascertaining at what depth this ore may be found, and until this has been done no dependable calculation either of expense or advantage can possibly be made. I am inclined to think it will be found considerably nearer the surface than in Europe ; because it is certain Captain Ashton obtained it either in veins or masses at the depth of about 35 feet. In Europe it is seldom found at a less depth than 60 or 80 fathoms or from 360 to 480 feet. However, notwithstanding this and other difficulties, I am inclined to believe the estimate which will

follow cannot very widely differ from what the result will prove if a trial be made from the data therein detailed.

From many observations which I attentively made in the country by observing the depth of water in wells and tanks, and the time the Natives took to empty them by the country method of drawing water, there are good grounds to conclude that the springs in those mines will not prove copious, and that at most six Pacotas will keep one mine clear with certainty—it is probable however, that half the number may answer ; but as it is better to avoid leading to error to estimate in excess. I shall consider six as requisite for one level.

The necessity of working day and night is imperious in all mines where water prevails. Captain Ashton emptied his every day and suffered them to fill at night. He had only therefore a few hours to work and this alone must have rendered all his proceedings abortive.

Six Pacotas on a stage will discharge 21,600 gallons or above $7\frac{1}{2}$ tons per hour.

Supposing a mine 180 feet deep—six stages of 18 feet each will be required, consequently the number of Pacotas will be 36. They work night and day in four reliefs—and require 1 head maistry 4 common ones and 288 coolies.

To dig, break or blast in one mine night and day in four reliefs—4 maistries, 40 men and 40 women and children will be required.

Gangs also of one head women and six children in four reliefs will be wanted to break, wash, and pick the ore for smelting—for one mine—4 head women and 24 children.

A simple machine to draw up the ore will in due time be constructed—the difference of expense between this and coolies will be about 1 to 2.

Smelting furnaces and Store-houses attached must be erected, two to each mine, that when one requires repair

the other may be resorted to—one furnace to work also night and day. This will require 4 fire maistries, 4 founders ditto—8 founders or smelters and 8 fire men, and to bring the ore and charcoal 16 children in four reliefs.

Two pair of large and two of smaller scales and weights will be indispensable.

It would be advisable to have an European miner and smelter at each Mine; they could doubtless be obtained from some of the European regiments, or from the Artillery.

The servants for one mine may be 3 intelligent boys from the Male Asylum to be employed as Interpreters and Superintendents and 1 Book-keeper. To each relief of water men and miners—1 conicopoly or 8 conicopolies for one mine—and one intelligent head Native to purchase charcoal, settle the carriage of copper to the Coast or elsewhere and perform such other similar services as may be required.

A Guard of one head and 12 inferior Peons to be employed in reliefs day and night.

A small assaying furnace with Tests, &c. for assaying the various ores will be indispensable, as only such as are rich in metal should be smelted, and it will here as elsewhere be doubtless of very different quality.

Charcoal must be purchased by the “*para*” or made on the spot, as circumstances may direct, and the support of Government will probably be requisite when the necessity occurs of having recourse to topes.

Two chests of Miner’s tools and a portion of Gunpowder cannot be dispensed with: 13, 14, 15—of the estimate will shew the probable produce of ore and copper. The cost of carriage to Ramapatam and thence to Madras by sea.

Collecting these details the probable expense per month will be thus exhibited.

Estimate for Opening and Working one Mine.

	Ps.	F.	C.	Ps.	F.	C.
1st.—Costs of 36 Pacotas at Pagodas 12 each. is Pagodas 432—Interest on which at 10 per cent per annum is per month . . .	3	26	20			
1 Head Maistry at per month	3	0	0			
4 Common at 2½	16	0	0			
288 Coolies at 1½ Fanams per day is per month.	288	0	0	304	26	20
2d.—4 Maistries at 2½ each per month	10	0	0			
40 Coolies at 1½ Fanams per day is per month.	40	0	0			
40 Women at 1 Fanam per do. do.	26	39	0	76	30	0
3d.—4 Head Women at 2 Fanams per day is per month.	5	15	0			
20 Children at 1 Fanam	15	15	0	18	30	0
4th.—This may cost 200 Pagodas—Interest of which as above is per month				1	8	0
5th.—2 Furnaces, Pagodas 400 . . Pags. 800 2 Store Houses, Pags. 200 . . . „ 400 Interest on Pagodas 1,200—as before	10	0	0			
4 Fire Maistries at 2½ per month	10	0	0			
4 Smelting do. is	10	0	0			
8 Firemen at Pagoda 1 each	8	0	0			
8 Smelters	8	0	0			
16 Women and Children at 1 Fanam each per day, is per month.	10	30	0	56	30	0
6th.—2 pairs large Scales and Weights—2 smaller—Pagodas 150—Interest at 10 per cent per annum is per month				1	3	0
7th.—1 European Miner 12 Fanams per day 1 Smelter	8	0	0			
	8	0	0	16	0	0
8th.—3 Asylum Boys at Pagodas 6 each per month	18	0	0			
1 Book Keeper „ „ 8 „	8	0	0			
8 Conicopolies „ „ 4 „	32	0	0			
1 Head Native per month	10	0	0	68	0	0
9th.—1 Head Peon at per month	3	0	0			
12 Ordinary do. at Pagodas 2 each	24	0	0	27	0	0
10th.—1 Assaying Furnace, Tests, Weights, Scales, Crucibles, &c.—say Pags. 100 Interest as above per month				0	7	40
Carried forward Pags.				570	29	30

Brought forward....Pages.		Ps.	F.	C.	Ps.	F.	C.
					570	2	50
11th.—When the Furnaces have acquired a sufficient heat, I presume 1½ times the bulk of the ore of charcoal will be sufficient to smelt it—I have found that a candy of the ore will be equal to about 4 cubic feet, a parah of charcoal will be equivalent to 4½ of the same measure, but it being better to estimate in excess, I take the ore to the coal, as 4 to 6, (both by measure, that is one candy of ore, will take six of charcoal to smelt it.							
When fairly at the ore, and completely at work, I shall, I trust estimate in minimum by taking the ore obtained and smelted every 24 hours at 12 candy, or 48 cubic feet. To smelt this it will require 540 parah of charcoal a month or Pagodas.....					45	0	0
14th.—Two chests of Miners' Tools, Pages.50							
Interest per month.....		0	18	60			
Gun Powder 1.100lbs. Barrel at 30		6	0	0			
Pagodas per candy.....					61	8	50
13th.—I calculate I believe greatly under the real produce at 360 candy of ore from one mine per month and that this will yield 40 per cent of Copper or candies 144. To carry a candy from the mines to Ramapatam it will cost Fanams 25. 144 candies will therefore cost.....					80	0	0
14th.—To carry 144 candies by sea from the Ramapatam to Madras, say £ 4 0 0 or Pagodas 10 per ton—144 candies are tons 32-2 3 12—which at the above rate is.....					321	6	21
15th.—1 Goldsmith or Assayer at 3 Fanams per day.....		2	0	0			
4 Stone Cutters at 2½ Fanams per day is per month.....		6	30	0			
2 Carpenters at ditto.....		3	15	0			
2 Hammermen at 2 Fanams.....		2	30	0			
2 Bellows Boys at 1 Fanam.....		1	15	0			
Contingencies which may have been omitted or unseen.....		10	0	0			
1 Havildar at 3 Pagodas per Month....		3	0	0			
6 Sepoys at 2.....		12	0	0	41	0	0
Costs per month for working one Mine					1034	9	61
Carried forward....Pages.					1064	9	61

	Rs.	P.	C.	Rs.	P.	C.
Brought forward....Pagas.				1054	9	61
In estimating the above, I have endeavoured to avoid every fallacy, and I conscientiously believe that, if the ore be found in the plenty appearances so forcibly hold out, the produce of a mine will considerably exceed the above estimate.—Let it be taken however as therein stated. This will be fine copper, and worth at the lowest estimate 70 Pagodas per candy. 144 candies then at 70 Pagodas will amount to Pagodas.....	—	—	—	10080	0	0
The cost of which as above is Pagas...	—	—	—	1064	9	61
Leaving a gain of Pagodas.....	—	—	—	9015	5	19

Should these expectations be once realized, mines may be opened in any number, and as the profits may be considered similar the magnitude of the project becomes extensive beyond the common powers of estimation.

I experience no inclination to any visionary proceedings, but having seen, and read of the immense advantages obtained by mining and convinced that what I have seen and read are quite dependable. Considering also the uncommon indications of abundance of ore in this country, not only of copper, but other metals and which I have personally inspected, I cannot help concluding that the subject is one, demanding the highest consideration as relates to the interests of the Company's Government in particular, and to those of the British nation in general.

Having shewn the probable advantages of opening mines in the districts where the best indications of ore may be found, I now offer to undertake commencing the work either on behalf of your Excellency's Government or on private account if undertaken for the former, perhaps the best mode would be on principles similar to

those of "Mr. Heath's" contract for saltpetre; that is, Government in the first instance to make the required advances; and to take the copper at a fixed rate per candy—or to allow me Pagodas 500 per month and a reasonable per centage on the whole produce, and Government to take the whole of the copper which may be produced, allowing me also a suit of Tents from their Stores until a residence can be erected.

If on private account, Government to extend the protection of their Police to the mines, by allowing the peons thereat, to be considered a part of that establishment, and under the authority of the district Magistrate, but attached to, and under the direct orders of the Director of the mines, and also to allow the guard of 7 Sepoys stated in the estimate to be attached to the works. Government also to direct their public Officers in the mining districts to extend the influence of their authority to the works, and also to use their power should it be required in enabling the Proprietors of the mines to procure a sufficiency of charcoal.

Ten per cent on the whole produce of the mines to be paid to the Government, and to be collected in such manner, as it may deem most conducive to their interests.

For the first year Government to allow the copper to pass free of duty both on land, and when exported, after which the usual duty to be collected, but at no subsequent period to be increased.

The year of free duty to commence from the transportation of the first quantity of copper produced by the mines.

Government to grant the Proprietors the exclusive privilege of working mines for copper or other metal or precious stones should any be discovered, first reporting the same to Government and working them upon such

terms as may be agreed upon by the parties, for the term of 10 years, or to the termination of the Company's present Charter, and at the expiration of this term, the privilege to be renewable on such condition as the then Government may see expedient.

Government to extend these privileges to the Heirs and Executors of the Proprietors subject to such conditions as circumstances may involve agreeably to the stipulations herein before stated.

With reference to a Metallurgical and Mineralogical survey of the country, whichever proposal the Government may judge suitable to adopt, I will commence it from the spot where the mines may be opened, as however, it cannot be expected I should be able to accomplish more than a commencement ; it will follow as a matter of course that if I continue to direct the mines the survey must be transferred to other hands. From this beginning however, should my mode of proceeding be approved of, it will be easy to carry it on, to any extent, as your Excellency will at once perceive, that all that is required will be to distinguish metals and minerals on the maps of those surveys already completed.

With relation to a districtal copper coinage your Excellency will be enabled to judge of its expediency long before the proceeding will be in a state sufficiently forward to adopt it, and it naturally follows as a subject for future consideration.

If, however, the mines be opened on private account, I would solicit the indulgence of the privilege of coining copper money to be granted to the Proprietors of the mines, in such latitude only as might be sufficient to pay the people employed in their works.

Your Excellency will perceive, that in Pacotas, Furnaces, &c. an outlay becomes unavoidable of Pagodas

2,132 0 0 but even adding the total charge of every description according to the preceding estimates of the amount, for opening and working a mine one month, will be no more than Pagodas 3,196 9 61 or £ sterling 1,279 13 a sum which considered with reference to the expense of a similar undertaking in England may almost be considered as nothing.

I have the honor to be,

Honorable Sir,

Your most obedient humble Servant,

(Signed) B. BISHOP.

FORT ST. GEORGE, }
June 25, 1822. }

A True Copy.

(Signed) T. R. WHEATLEY,

Secretary to Government.

A True Copy.

C. A. KERR

MEMORANDA ON THE COPPER MINES IN THE
NELLORE AND CUDDAPAH DISTRICTS.
APPENDED TO CAPTAIN B. BISHOP'S REPORT.

In Cornwall there are a set of people generally experienced Miners out of employ from the failure of mines, who traverse the country in all directions in search of new ones.

When they discover a new mine the Public Inns are frequented where the London coaches stop, and report made to travelling adventurers of whom there are numbers, that they have discovered a new mine, of whatever metal it may be, and that it possesses every appearance of proving a rich one, with such other matter of inducement as his ingenuity and ability can devise, he is seldom long before he finds some one inclined to engage in the speculation.

The adventurer mentions this to his friends in London, who engage in the first instance to advance a sum of money sufficient to open the mine, to obtain some ore and procure an assay, usually made by the man who discovered the mine, who previously stipulates that, he shall be employed in the direction of it upon certain allowances as Captain of the same.

If upon assay the ore he found sufficiently rich, and other matters also promising fair, the men who advanced the money in the first instance form a company, generally in London. This effected and a capital raised, one of them is commissioned to proceed to the place, with authority to make advances, and institute other arrangements for opening the mine with promptitude and effect.

When I was in "Cornwall" in 1815, a lead mine had been thus discovered near "Truro," which ore upon assay was said to yield 300 ounces of silver in a ton of lead. vidé "Landaff's chemical assay" vol. 3, page 312.—Sir

Hugh Middleton is said to have cleared from his lead mines £3,000 per month which enabled him to undertake the great work of bringing the new river from "Ware" to "London," but this mine is probably richer in silver than his were. The Company had proceeded to the expense of upwards £20,000, when I was there, in erecting Steam engines, to clear the mine of water, and buildings and furnaces &c. to extract the silver and recover the lead. The principal in this concern, I understood was the famous radical "Alderman Wood" he had mortgaged his share, I have been informed, to enable him to carry on his dangerous schemes in the affair which so lately agitated the British public, and it was privately reported when I left London that in consequence of his plans of policy, failing; his share of the mine had been transferred to other hands. Whether it fully answered the expectations of the speculators I have not been informed, with dependable certainty but I have heard that it had done so. I was at the mine, saw the ore, brought a specimen therefrom, and have seen one exactly similar said to be found somewhere in this country. It was given to the best of my recollection to "Dr. Hayne," by a Native, who reported that he found it among Hills somewhere in the Cummum country. In my late excursion I have heard of a person acquainted with the situation, and who has some of the ore in his possession. The increase of excessive heat and a temporary illness prevented me from proceeding to the place, but as the ore I have seen was the steel grained, and very similar as before noticed to the Cornwall ore, there are reasonable grounds to conclude, it may prove as rich in silver as that is said to be.

I was informed by several old and respectable inhabitants of Cornwall, that of all the mines which were opened in that country for many years past, one half of them had failed, the other moiety had been successful, and that

immense fortunes had been realized by the successful speculators, while those who had been less fortunate had been completely ruined; sometimes they observed that, several successful mines had been opened in succession, but it had also often occurred, that as many had failed; the fair average in all cases however, they appeared to have decided, was as before stated.

The districts I have been in, may be justly designated the Cornwall of India, but with all external appearances decidedly in their favor. Here is little difficulty in ascertaining where a mine may be found, symptoms entirely unequivocal crop almost every where upon the surface, and wherever the earth has been opened where copper has been indicated, its ore has been invariably found. Ashton has opened four within a short distance of each other near a village called Gurmeny Penta, and I have been informed by people he employed, ore in abundance was found: he did not abandon them on account of failure in this instance, but in consequence of water pouring in faster upon his endeavours than he had the means of clearing and the last he opened which seemed the richest, was given up in consequence of one of his people being seriously injured by the falling in of a part of the mine; but from what I have observed on the site of Ashton's proceedings, it is evident he had not sufficient knowledge of the business he had undertaken ever to have effected any thing of consequence in a work of this nature.

In addition to the mines attempted by Ashton, I have found the following, all of which are of fair promise and some of them remarkably so near a village called.

P—a. 1

O—r. 2

N—a. 1

S—a. 1

Could I have proceeded I should have discovered many

more, one only of these I opened, and the prospect is most encouraging, though I sunk no further than about ten feet, the ore increased in quantity, and I have no doubt if followed, the mine will be found as abundant as could be desired even by the most sanguine expectations.

The veins, or masses of ore I am certain lie deep, because it does so in all the mining countries of Europe, and from observations I have made, it appears every where to lie far beneath the general level of the earth, but there are perhaps few places known in any country, where ore, in such plentiful indication on the surface can be found, as in the part of the country, I have examined.

Twenty mines may be opened here simultaneously at a much less expense than one could in Cornwall and should one half of them fail, the other would realize all expectancy but the great chances in my opinion is that, they are all connected, one with the other, and if so, all in some degree would ensure success.

In every place I have seen, there is reason to believe water will be found at 10, 12, 15, or 20 feet deep, if ever then mines are wrought with effect; entirely efficient means to get rid of it must be the primary object.

If steam engines could be obtained in the country their great consumption of fuel would prohibit their use, but the country Pacotah by a simple combination of them, stage above stage, will enable water to be thrown to any required height; and by multiplying their number in each stage, they may be brought to equal the steam engine in power as an hydraulic machine though they would not compete with it as a first mover.

I have said all copper mines are deep seated below the level of the earth, they are said by Mineralogists to be seldom found but in primitive rocks, these are of

course the basis of all mountains, and as further illustration of this, the cornish mine which I before mentioned, although found originally on a hill, did not offer any thing further than indication of metal, until the shaft had been sunk considerably below the surface of the surrounding country.

From this and what has been already stated, it cannot be expected that any material quantity of ore will be found in any other situation, both science and skill will therefore be required to obtain it, to sink the shafts, and construct the galleries with security, and some simple and effectual means to raise the ore from the mines, and afterwards to melt and cast it into marketable copper—Ashton's deepest mine may be 30 feet and water had not materially obstructed him, he however to disencumber himself from such as did obtrude, only sunk an adjoining well to drain it off. This could not possibly have the effect intended, unless he had adopted means to empty the well, as the water would soon find the same level in the one, as in the other, but not having done this, all his labour proved fruitless. This mine however, from the information I have received, had already produced either a vein or a mass of ore, the passage to which, he has carefully built up with stones.

The more material obstacles which offer themselves is the variety of soil, which every place I have seen, is similar, it appears to be entirely debris from former mountains, and is composed of various earths and differently constituted strata, and stones of all shapes and sizes. The earth is for the most part loose and friable. The rocks variously constituted, but principally of gneiss or mica slate and a species of slate which I have named shorelite, some however are of quartz, felspar, sionite, and granite; in the loose earth shoreing must be resorted to, and all the rocks, excepting the mica slate,

will only yield to the efforts of gunpowder. In all this variety of rocks, I have found copper.

Timber is scarce all over this part of the country, and galleries cannot be rendered of use without it, or a substitute of equal efficacy, the latter is fortunately at hand and the mines themselves, will afford it in abundance most of the rocky strata below the surface are of a slaty nature, easily spilt and divided into any form, they will therefore answer every purpose even better than timber it being firmer less, elastic, and more to be relied upon as effectual support.

From what has been said, it is evident these mines could only be opened with effect by a Company, or the Government; if by the former they must possess the protecting power of the latter, and their Police must be extended to all the works; the necessity of this becomes obvious, when their situation in the country is considered, where secure store-houses cannot be easily or promptly erected, and where the metal when in a marketable state, will in all respects be equivalent to cash, and adverting to para. 22, literally so.

Were these mines opened on an extended scale, there can be little doubt of their producing advantages of great consequence: On these grounds I should conceive it entitled to the serious consideration of the Government, as a transaction of more importance to their pecuniary interests than any perhaps before contemplated particularly as a few months would ascertain the nature and probable extent of future prospects and at an expense of no consideration should they turn out, according to every rational expectation (and I conceive it only possible they will not) a source of riches will be attached to the state beyond every other they have heretofore enjoyed from other commercial or manufacturing speculations.

That this country is rich in metals, a doubt I think

can hardly be entertained, perhaps containing them in as great abundance as South America, and that a Government of such extent, riches, greatness, intelligence and power, should have allowed it to remain so long, without causing it to have been regularly Metallurgically and Mineralogically surveyed is a matter so anomalous to their high wisdom that I confess myself without the power or means in any way whatever to surmise or account for it.

Both these great objects may be accomplished at a comparatively small expense and should my humble abilities be considered equal to such a performance, and to open the copper mines at the same time, I am willing to undertake the whole and to submit plans and estimates of the probable expense they will incur all of which and greatly more, I have no hesitation in concluding would in a few months be amply repaid by the produce of the copper mines; should a plan of this nature be determined upon I may venture to pledge myself, that, as much benefit on the one hand in a commercial view, and, as much honor on the other, in a scientific one, will accrue to the Government, as ever has arisen out of any transaction of a pecuniary nature, they have been engaged in, since they have swayed dominion as a sovereign state.

The ores of this copper will afford the metal in a pure state at an expense greatly inferior to the expenses incurred in Europe, as it requires only one smelting, whereas, before it can be brought to the same state in Europe, it requires *many*, in some places it is smelted fifteen times, before it becomes pure copper. The Indian copper then is at once in a fit state for coining into money and copper coin being extremely scarce in the districts I have been in, and likely in most others, great embarrassment is experienced—by the Ryot in

particular, but also by others for want of this minor exchange, coining a copper currency then, at, or near, the mines, would prove an advantage to the Revenue not readily estimated, a simple apparatus, with the metal in the first instance cast into convenient Ingots would establish this, reserve the charge of bringing copper coins from England, and the expense of carriage involving itself in the advantages gained would together amount nearly to rendering all the money thus coined a clear gain.

It being certain that the Nellore and Cuddapah districts and the Guntoor Circar abound in copper, it is by no means than irrational to expect it in the same parallel even from Nellore to Nepaul; as accounts have been published of mines being worked for copper in this direction, and from what I have myself observed, heard, and read, there are strong grounds for the inference that, from Cape Comorin to the Himalaya mountains, perhaps far beyond them, a parallel will be found constituted chiefly of Metalliferous strata rich in metals of every description. The surface of the earth in a north and south direction, is for the greater part, where plains exist, evidently the basis of a former chain of mountains, now in many places converted by the natural progress of nature into levels, indeed wherever excavations have been made this is demonstrated. There is every promise then, if the country were surveyed in the manner I have suggested, to conclude that, the immense advantage of a districtal copper coinage might be extended through nearly the greater part of the Company's dominions, and at a trifling incipient expense which would in a comparatively short period be re-imbursed, and a permanent source of wealth established.

I experience a conviction on my mind there is a little speculation in these ideas. I have seen and attentively examined Cornwall, the source perhaps from whence the

grandeur of Britain has been drawn, but I have in this country such prospects as have never been seen in that or any other part of England. Every appearance in the range I have examined, seems to say search, reward is certain.

I shall conclude this with observing that I can never consider the British Government will ever act with such ill-advised and fatal imprudence as to deprive the Company of their Charter, for should they do so, the loss of the British Empire in the East, will date its down-fall from the day Great Britain assumes exclusive dominion over this country or dominion in any form save that delegated to the East India Company, my reasons for this opinion are too extensive to detail on this occasion, they are obvious however to all who have attentively and without prejudice, or other less excusable views considered the subject, and will at an early period be demonstrated, should ever the fatal arrangement happen; but I take it for granted such an event can never occur, until the British Government foregoes all its established sagacity and wisdom, but as this is an event not likely to take place I shall consider the Company's Government permanent, and considering it so, if I should prove the means of opening the riches contained in the hidden recesses of their extensive territory and of having the country Metallurgically and Mineralogically surveyed, I trust I shall not be considered vain, If I should think that I have done something so materially conducive to the Company's interests, as to be entitled at least to remembrance.

(Signed) B. BISHOP.

A true Copy.

(Signed) T. R. WHEATLEY.

Secretary to Government.

A true Copy

C. A. KERR.

REVENUE DEPARTMENT.

No. 352.

*Extract from the Minutes of Consultation, under date
the 18th April, 1834.*

The Governor in Council proceeds to take into consideration the following letter from Mr. De Fondclair with reference to the Minutes of consultation, dated 25th October 1833.

(Here enter 29th January 1834. No. 84.)

1. The Governor in Council is pleased to authorize the grant of a lease for 21 years to De Fondclair and Co. of all the mines of copper ore, in lands belonging to Government, in the Talooks of Duppaud, Cumbum, Giddalore and Budwail in the district of Cuddapah and Cottagherry, Kavaly, Duttalore and Buddapoody, in the district of Nellore with a preference of renewal, if approved by the Court of Directors, on payment of a fine, the amount of which shall be determined, in the event of competition, by taking an average of all the offers and deducting therefrom 25 per cent ; or if there be no competition by the award of three arbitrators, one arbitrator to be chosen by Government, another by the Company and the third by the first two, upon inspection of the accounts of the Company for the last five years of the lease, allowing an advantage of 25 per cent to the Company.

2. The Governor in Council is further pleased to resolve that the produce of the Mines that may be worked by De Fondclair and Co. in the said Talooks, shall be entirely exempt from any duty or impost whatsoever for the period of ten years from the date of the lease, and that thereafter the amount of duty or impost to be levied on such produce either crude or manufactured, shall not exceed ten per cent of the value accord-

ing to the authorized Tariff of the district in which the levy shall be made. It will be at the option of the Government to direct duty to be levied either upon the raw produce of the mines, or upon the Copper prepared therefrom, as may be deemed fit, subject to the above limitation.

3. All machinery, whatever, British or Foreign, imported for the purpose of being employed in the Mines worked by De Fondclair and Co. and all timber and stores imported for the same purpose during the period of this lease shall be exempted from duty, on the same being properly certified to the officers of Customs.

4. As the sole object of Government in granting this lease is to give encouragement to active exertions directed to develope and bring into use the Mineral wealth of the country, it is necessary to provide that unless effective measure are taken and followed up for the purpose intended, it shall not be allowed to stand in force, that so it may not be obstructive of the efforts of others, if from any cause the present Company should fail to pursue their undertaking with the spirit and energy necessary to render it successful. The Governor in Council therefore resolves to make the following conditions, viz. that at the expiration of three years from the date of the lease it shall be incumbent upon De Fondclair and Co. to shew that they have established and are working mines for raising copper or means of machinery within the limits assigned to them in both the districts of Cuddapah and Nellore; and to prove by their accounts that they have actually exported therefrom and exported a quantity of copper calculated to yield 400 tons of copper metal, or that they have expended in their operations, and in the purchase of machinery, &c. not less than 3,00,000 Rupees; and that they shall continue to carry on their mining operations.

tions in both districts, and at the end of the next 2 years, shall prove by their accounts that they have raised and exported, within that period, a quantity calculated to yield 1,000 tons of copper; and at the end of the next five years, that they have raised and exported, within that period, a quantity calculated to yield 2,500 tons of copper; producing fair samples of the ore exported, and exhibiting the actual out-turn of the sales effected by the Company if they carry on the operation of smelting the produce, as well as mining that they shall export or have ready for export within the first period 400 tons of copper, within the second period 1,000 tons, and within the third period 2,500 tons.

5. It shall be a further condition that the Company in their mining operations shall not enter or encroach upon cultivated or arable ground without the licence of the Collector which shall not be granted until they have made full compensation to the occupant, and entered into an agreement to pay the regulated assessment to Government at the usual periods. The compensation to be paid to the occupant shall be determined by the Collector if there be any dispute and generally all disputes relative to the occupancy of lands by the Company under this lease shall be determined so far as the Company are concerned by the Collector, subject to an appeal to the Board of Revenue by whose decision the Company shall abide.

6. The Collectors and Magistrates in the districts in which mines shall be worked will of course give due support and protection to the servants of the Company and the people employed in them, but they cannot be permitted to extend to them any unusual privileges.

7. The lease shall be granted to De Fondclair and Co. their Heirs and Assigns, the counter part of the lease shall be executed by the existing Members of the

Company and no assignment shall be made of the interest vested in them respectively or of any share thereof to any other party without a notice in writing being given to the Chief Secretary to Government one month previously. Provided that nothing in the lease to be granted shall be constructed to authorize the stay or residence of any member of the Company in India or any part thereof contrary to the intent and meaning of any Law or Regulation made or without lawful licence.

8. On failure of any of the conditions the lease shall be null and void, if the Governor in Council shall so determine.

9. The Governor in Council will be prepared to confirm any leases that the Company may obtain from Zemindars of the right of mining for copper ores for a period not exceeding the period of this lease, provided the terms thereof be conformable to the regulations and to grant a like exemption from duty to the produce of the mines worked under such leases and to the machinery, &c. imported for working them as is mentioned above.

A true Extract.

(Signed) D. ELLIOTT,
Officiating Secretary to Govt.

A true Copy.

C. A. KERR.

REMARKS.

By these reports of Dr. Hayne and Captain Bishop some idea may be formed of the value of the undertaking, at least as to the promise of abundance of ore. The next point is to establish its richness, to do this will be a matter of some little difficulty as in all ores there are some richer than others,—at Madras a number of Gentlemen who interested themselves on the subject had a parcel of the ore roasted before them, pounded, and reduced in a crucible. The yield was fully fifty per cent. The richest part of the ore has been found from a similar process of reduction to give 65 per cent and it is calculated that the average yield of the ore will be “*forty per cent of metal.*” If the Cornwall ore a *Sulphuret* gives but $7\frac{3}{4}$ per cent. and brings at the mine head £5 17 0 a ton the value of the Nellore ore holding 40 per cent of metal and of easy conversion must be great. It must be borne in mind, as Captain Bishop states in his report, that the (*Sulphuret*) of England requires sometimes to undergo *fifteen processes of refinement* and the Nellore ore (a carbonate) but one smelting.

The batch of ore referred to above, as sent Home by Capt. Ashton, and remarked by Capt. Hayne in his report, as *all the rubbish Captain Ashton's Headman could find about the mines*, weighed 393 cwt. 6 qrs. 13 lbs. about 7 cwt. short of 20 tons, is (*at 21 cwt. per ton being the customary allowance in Cornwall for wastage and dirt*) 18 tons, 15 cwt. 0 qr. 13 lbs. produced 79 cwt. 0 qr. 10 lbs. of *copper*, worth at that time in the year (1805) £100 per ton :—It is usual to charge £3 a ton for smelting; with this consignment of Captain Ashton, was sent Home 4 specimens of ore, which were assayed by

the Agent of the "*Welch Copper Company*" who declared the results to be as follows.

		dwts.			dwts.		
No. 1	produced	9—0 $\frac{3}{4}$	in	20	or	45 $\frac{6}{32}$	in 100.
„ 2	„	9—13 $\frac{1}{4}$	„	„	„	47 $\frac{28}{2}$	„ „
„ 3	„	3—4 $\frac{1}{2}$	„	„	„	15 $\frac{11}{32}$	„ „
„ 4	„	6—4 $\frac{1}{2}$	„	„	„	30 $\frac{28}{32}$	„ „

The introduction of a rich copperore into England from her own Colony in quantity and of ready and easy reduction would doubtless have injured beyond calculation the copper mining interests of Cornwall and Wales, and it is not surprising that the results shewn by the "*Welch Company*" are so different to what they should have been, when we reflect how much depends on the mode of reduction adopted, and the care bestowed on the process, an excess of heat or protracted exposure, destroying the metal. It is only a matter of wonder that the ore was *allowed* by them to yield so much as 23 *per cent*.

The question will naturally be asked, why Captain Ashton relinquished so fair a field? It appears that Ashton was but slightly acquainted with his subject, was not possessed of the means of proceeding with an undertaking which to carry on successfully has always required vast capital. Ashton by his reports to Government appears during the five years lease he obtained, to have got out but a single Miner from England to have become embarrassed in his circumstances, and to have been compelled from want of funds pursuing the adventure. His friends now in the service assert, that on quitting the country he is said to have remarked "*that he had left at the Nellore copper mines, an inexhaustible source of wealth for some more fortunate man.*"

“ Mr. Haynes” reports carry on the face of them due weight—he was the Company’s Naturalist on the Madras Establishment. Captain Bishop’s opinions are also valuable, his death almost immediately after making his proposals to Government (to which they acceded) set the subject at rest, until I called the attention of the public to it. Captain Bishop was an Officer of the Madras Army and Superintendant of the Powder Mills at Madras, he was considered a very scientific man.

In November 1832, I first entered upon my enquiries, regarding these mines and in conjunction with certain parties in Bengal and England, determined on relinquishing the Company’s service and embarking in the undertaking—the failures in Calcutta in the early part of 1833—and the consequent losses in England deranged my plans—in the meantime I spared no exertion or expense in getting the districts surveyed, and at a very heavy outlay have been enabled to make a selection of a country abounding in copper ore : these tracts have been granted in lease to the present “ *Company*” designated “ *De Fondclair & Co.*” which has been established through the joint efforts of myself and Mr. De Fondclair : cowles or leases of the exclusive right of mining for copper ores in the lands of the Rajahs of Calastry and Vencatagherry have been obtained for the Company, as also from the Nabob of Udagherry to the west of the mining districts abundance of wood and charcoal for smelting is to be had, and about 40 miles distant in the “ Nullah Mullay” range of mountains, timber of immense growth abounds—the expense of carriage to the works (which on the woodiwar or country bandy is a trifle) being its only cost. Granite and carbonate of lime, are at hand in abundance, and the distance from the present mines to the coast is but 40 miles of level country.

Any person at all conversant with mining operations will at once perceive the extraordinary waste of human labour, by which Captain Bishop proposed to work these mines; *as* a commencement it *might* do very well, until the value of the undertaking is established, but the saving that must accrue by substituting "*Steam*" and other machinery in lieu of men to lift up the enormous quantities of ore and water daily raised—as also from the adoption of the system of mining pursued in Cornwall where the most beautiful and harmonious means are rigorously followed to save manual labour and to employ it to the greatest advantage is evident.

After the sinking of the shafts, and so soon as the ore in quantity is arrived at, the estimated expenses attending the raising and conversion of ore into metal will according to my calculation be as follows.

<i>Dr.</i>		<i>Cr.</i>	
To breaking and raising	}	By 40 tons of	copper in pigs,
100 tons of ore at 15		the produce of	
Rupees per ton.	1,500	160 tons of	dressed ores
To spalling (i. e. reducing	}	at the estimat-	ed average pro-
the large rocks of ore in-		duce of 40 per	
to small pieces fit for the	50	cent metal in	the ore, taking
stamping miles) 8 Ans.	}	the copper to	be of the value
per ton.		of rupees 1000	
To Stamping 100 tons of	}	per ton is ru-	pees—40,000,
ore fit for smelting at 12			
Annas a ton.	75		
To Dressing 100 tons of ore	}		
including the calculation			
and carriage of the ore	300		
from one place to another	}		
at 3 Rupees a ton.			
To smelting 100 tons of	}		
dressed ore at 50 Rupees a			
ton.	5,000		
	<hr/>		
	Rupees	6,925	
To balance of profit on sale	}		
of 40 tons of copper pigs		33,075	
the produce of 100 tons of	}		
dressed and picked Ores.			
	<hr/>		
	Madras Rupees	40,000	Mad. Rs. 40,000
	<hr/>		

The above shows a profit of Rupees 33.075 upon 100 tons of picked and dressed ores, and by this calculation the value of raw ore picked and ready for conversion, would be about 350 Rupees a ton.

So soon as workmen and smelters can be procured from England, it will be the interest of the association to reduce their ores in this country, until then, the crude ore might as dead weight be sent home and become an immediate source of great profit.

The liberality of Government, as manifested "*by the minute of Council*," gives the Company an exemption from

all duty for the first 10 years of their lease and the magnitude of the undertaking can only be limited by the outlay applied as all the lands supposed to contain these ores and to a very great extent have been secured to the Company.

These mines, as Dr. Thomson justly remarks, were worked some centuries ago, and in the survey I lately made I discovered excavations of the most astonishing description, where copper ores had been obtained by the Native powers under former Governments, and when we consider the ages that have passed since the use of brass utensils first obtained and have been considered a necessary part of every Brahmins domestic establishment, and when we observe the annual demand in Bengal for copper to the amount of *crores* of rupees—we are naturally led to the question, *how*, and from whence was the supply of this useful metal obtained, before India became known to us. Copper ores we know are not confined to this part of India, for in many parts of India they manifest themselves, although no where in such richness, and so near the surface, as in the grants of the present Company. In Bengal copper mines are worked by the Natives at the present day ; some idea prevailed that the Nellore copper ores were found alone in “*nests*,” not “*veins*” I have however “*proved*” the contrary, a peculiarity certainly attaches to the ore called by Dr. Thomson “The *anhydrous carbonate of copper*” in its invariable position in “*nests*” as far as my experience has hitherto gone, but malachite I have always found in “*veins*,” as also a steel grained crystallized silvery ore which I have invariably found in green-stone slate and partly embedded in quartz, this last ore is the richest I have met with, and a parcel has been sent Home for report.


“ In the Valenciana mine in Mexico 3,100 men were

“ daily employed, whose labours sent up between 300
 “ and 400 tons of raw ore—1,200 of these men were em-
 “ ployed in boring and blasting about 600 holes in the
 “ twenty four hours, each hole of four feet eleven inches
 “ deep “ Baron Humbolt” one of the best authorities
 “ of the day, says, in relation to the Mexican mines.
 “ The mines of “ *Rayas*” continues to furnish extreme-
 “ ly rich ores while at “ *Valenciana*” they have en-
 “ deavoured for some years to supply, by the extraction
 “ of a greater quantity the deficiency in their intrinsic
 “ value.

“ All the valuable mines, namely, “ *Valenciana*,”
 “ *Tapeac*, “ *Cota*,” *San Lorenzo*, “ *Sirena*,” *Mellado*,
 “ “ *Fraustros*,” “ *Rayas*,” and “ *St. Anita*,” being in-
 “ cluded in a distance of 8,529 feet, there is every reason
 “ to believe that in each of those mines similiarly rich ores
 “ may be found, as in the *Valenciana*, and *Rayas* mines,
 “ but at different distances from the surface.” In this
 “ celebrated mine (the “ *Veta Madre*”) there is a cer-
 “ tain middle region, which may be considered as a de-
 “ pository of great riches, for above and below this re-
 “ gion the ores have yielded an inconsiderable share of
 “ metal at “ *Valenciana*” the rich ores have been in
 “ the greatest abundance between 328 and 1,115 feet
 “ below the surface, while the abundance appeared at
 “ “ *Rayas*” at the surface.”

These remarks of “ Humbolt” show that it is no un-
 usual thing to find the fairest promise on the surface, as
 in the case of the “ *Rayas*” mine, and also in the “ *Nel-
 lore mines*.”

The formations in the mining districts are all primi-
 tive, and the richest ores have been found within a few
 feet of the surface, and not confined to one spot, but over a

vast range of country—under such circumstances, it would be matter of surprize indeed, that on search and on following these veins, large depositories of ore were not discovered, indeed a report (of Mr. Travers's, the Co-
 I have seen, states that blocks of the ore had been used at Gurramenapentah to mend the village tank, which were subsequently removed by Ashton.

I have given this subject my most full attention, I have visited all the localities, have mined, and followed the veins,—examined thoroughly the different districts and their formations, and my firm opinion is, that any quantity of the richest ore may be obtained, at a trifling expense, and within 100 feet of the surface, charcoal, lime, timber, stone and clays, are all abundant and available for the use of the association almost immediately on the spot, and nothing I consider can prevent the entire success of this mining undertaking; as Government have allowed Covenanted Servants to hold an Interest in the “Iron and Steel company,” it is supposed no objection can exist to their holding in a like manner Shares in this association:—If the idea obtains that receiving dividends from a “Mining Body” savours of trade, equally so did dividends payable on the India Company's Stock; it is simply the investment of money (in this case) with a public body the Direction of which guards its interests, and the individual Share-holders may therefore be in no wise concerned in its management:—I hope the Government will be too liberal to regard it in this light, but if unhappily such objection be started a facile mode of investment or purchase of a share, in the name or for the benefit of relatives, remains.

Nothing can prevent a Covenanted or Military servant purchasing shares for a son, brother, or sister, and vesting the management of such in Trustees.

C. A. KERR.
